

**Haskel**  
an Accudyne Industries brand

Pressure on Demand

*Pneumatic and Hydraulic Driven  
Gas Boosters*



## Why Use a Haskel Gas Booster

Haskel pneumatic and hydraulic driven gas boosters offer a flexible and efficient source for delivering high pressure gases.

**Oxygen or High Purity Cleaning:** Haskel boosters are noted for their cleanliness and can handle pure gases such as oxygen without risk of any contamination. (Special cleaning required – advise factory.) Haskel's oxygen cleaned products are certified per Mil Spec 1330. Refer to the Knowledge Library Link on the Haskel website, [www.haskel.com](http://www.haskel.com), for the Oxygen Usage - Best Practice Guide.

**Multi-Staging Capability:** For higher flow rates and pressures, beyond the capability of a single gas booster, one or more boosters of the same ratio may be plumbed in parallel and then in series with one or more boosters of the same ratio.

**High Flow Rates at High Pressures:** When high flow rates at high pressures are needed, the booster can charge a receiver to an even higher pressure level, thus storing a volume of gas available for rapid release at a constant pressure through a pressure reducing valve.

**Cost Savings:** Most industrial gases are commonly delivered at pressures of 2,000 – 2,600 psi in steel cylinders. If the gas is to be used well below the supply pressure, the pressurized supply is easily piped and controlled to the point of use with simple valving. However, if the end use requires the gas to be used at higher pressures than the supply it will have to be boosted. Gas Boosters can utilize all the gas from a supply source such as cylinders, and boost the gas to whatever pressures (and flows) are required by the application; thus utilizing all the gas volume from the supply source.

If the application requires a pressure greater than common supply cylinder pressures, a booster can often be justified not only because of utilization of the gas, but also because it will eliminate the need to purchase the gas in special higher pressure more costly supply cylinders such as 3,600 or 6,000 psi.



### Pneumatic Driven Gas Booster Features

- Reliable, easy to maintain, compact and robust
- No heat, flame or spark risk
- Infinitely variable cycling speed and output
- Pneumatic driven models do not require electrical connection
- Easy to apply automatic controls
- No limit or adverse affect to continuous stop/start applications
- Seal systems designed for long working life
- No airline lubricator required
- Hydrocarbon free – separation between air and gas sections
- Pressures to 39,000 psi (2690 bar)
- Built-in cooling (most models)
- Standard & custom systems available
- Suitable for most gases
- Single, double acting, and two-stage models
- Ability to stall at any predetermined pressure and hold the fixed pressure without consuming power or generating heat

# Introduction to Pneumatic Driven Gas Boosters

## Theory of Operation

Haskel Gas Boosters consist of a large area reciprocating air drive piston directly coupled by a connecting rod to a small area gas piston. The gas piston operates in a high pressure gas barrel section. Each gas barrel end cap contains high pressure inlet and outlet check valves. Varying applications require many different booster and horse power (HP) combinations. Haskel can assist with HP and Cooling requirements and provide circuitry assistance on the following issues: PID Control - review and advisement, electrical control, and heat exchanger recommendations. General HPU recommendations and guidelines are available from Haskel drawing 87100-TAB. The air drive section includes a cycling spool and pilot valves that provide continuous reciprocating action when air is supplied to the air drive inlet. The ratio between the area of the air drive piston and the gas driven piston is indicated by the number in the model description and approximates the maximum pressure the gas booster is capable of generating.

Isolation of the gas compression chambers from the air drive section is provided by three sets of dynamic seals. The intervening two chambers are vented to atmosphere. This design prevents air drive contamination from entering the gas stream.

Haskel gas boosters are used for boosting most all commonly available industrial gases. However, the gas should be "Dry Gas", (no moisture content.) Some gases cannot be pumped with standard boosters, e.g. pure Oxygen or Hydrogen. Depending on the gas and application, e.g. Dry Gas Seal applications, some boosters will require special seals, materials of construction, venting, special cleaning and other considerations. Knowing the specific gas is also necessary to determine gas compressibility at the desired pressure. Compressibility is a factor used in calculating flow rates at different pressures or filling times into a vessel.

Gas booster compressors are suitable for transfer and pressurization of:

1. Nitrogen (N<sub>2</sub>)
2. Helium (He)
3. Breathing Air (N<sub>2</sub>O<sub>2</sub>)
4. Nitrous Oxide (N<sub>2</sub>O)
5. Carbon Dioxide (CO<sub>2</sub>)

6. Neon (Ne)
7. Argon (Ar)
8. Sulphur Hexafluoride (SF<sub>6</sub>)
9. Oxygen (O<sub>2</sub>)\*
10. Carbon Monoxide (C)\*\*

11. Hydrogen (H<sub>2</sub>)\*\*
12. Methane (CH<sub>4</sub>)\*\*
13. Ethylene (C<sub>2</sub>H<sub>4</sub>)\*\*
14. Deuterium (D<sub>2</sub>)\*\*
15. Natural Gas (CH<sub>4</sub>)\*\*  
*(often contains high proportion of CO<sub>2</sub> & N<sub>2</sub>)*

**Note: Liquefied gases (propane, CO<sub>2</sub>, nitrous oxide, halons, etc.) can be boosted as a liquid or gas in controlled applications.**

\* Oxygen (O<sub>2</sub>) - maximum safe working pressure 345 bar (5000 psi).

\*\* For these gases (10-15), the gas booster must be operated in a safe and well ventilated area and vent(s) piped to controlled environment.

Cooling is provided by routing the cold exhausted drive air through an individual jacket surrounding the gas barrel.

Check valves also allow for the equalization of upstream and downstream pressure prior to boosting, therefore the gas booster only needs to "raise" the upstream pressure to the required pressure and does not have to raise it from atmospheric pressure.

## Operating temperatures for Gas Booster

There are two distinct sections: the air drive section and the gas barrel section.

**Air Drive Section-** Standard Air Drive Seals should perform reliably within a temperature range of (25°F to 150°F) (-4°C to 65°C). Lower temperatures will cause air/gas leakage; higher temperatures reduce seal life. Haskel recommends a minimum Class 4 air quality per ISO 8573.1 standards. For operation at extremely low temperatures, consult factory.

**Gas Barrel Section-** Low temperatures normally have little effect on the operation of standard parts and seals. The heat from the compressing gas helps to balance out an acceptable temperature.

**Maximum average acceptable temperature 115°C (240°F).**

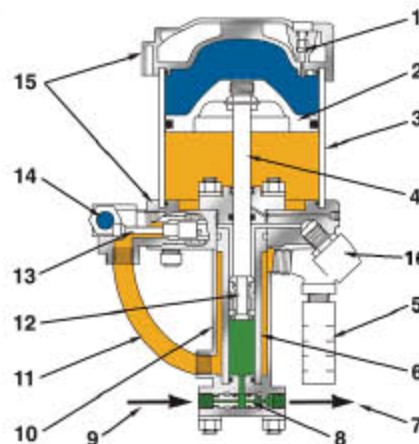


Figure 1

Figure 1: Example of Single Stage, Single acting Booster

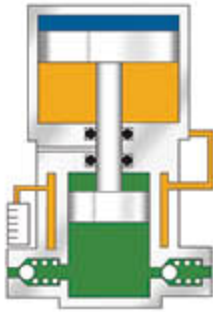
1. Pilot Valve
2. Air Piston
3. Air Drive Barrel
4. Connecting Rod
5. Exhaust Muffer
6. High Pressure Barrel
7. Booster Outlet
8. Check Valves
9. Booster Inlet
10. Cooling Jacket
11. Air Exhaust Tube
12. Gas Piston
13. Air Cycling Valve
14. Air Drive Inlet Port
15. Upper & Lower Caps
16. Vent Port Breather

# Pneumatic Driven Gas Booster Configurations

Single acting, single stage boosters are the smallest and lightest with pressures to 39,000 psi.

Double acting, single stage provides twice the delivery of a single acting single stage booster.

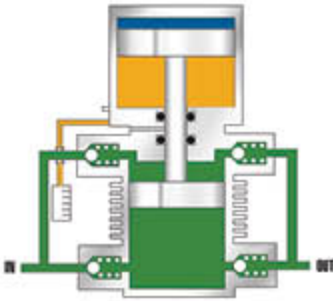
Two stage models are used for high gas compression ratios.



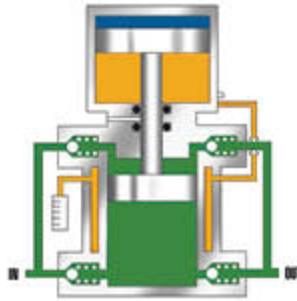
**Model AG**  
Single Stage, Single Acting



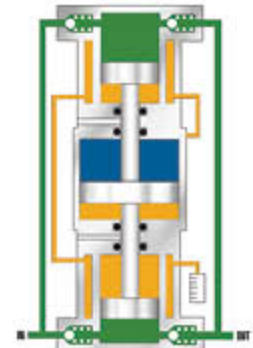
**Model AG**  
Single Stage, Single Acting,  
Flow Thru Piston



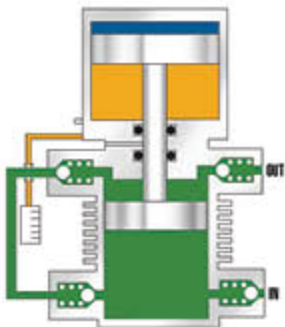
**Model AGD**  
Single Stage, Double Acting,  
Cooling Fins



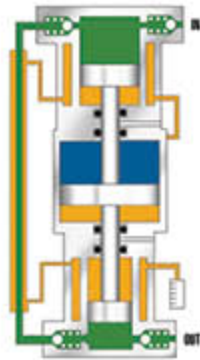
**Model AGD-4 (only)**  
Single Stage, Double Acting,  
Cooling Jacket



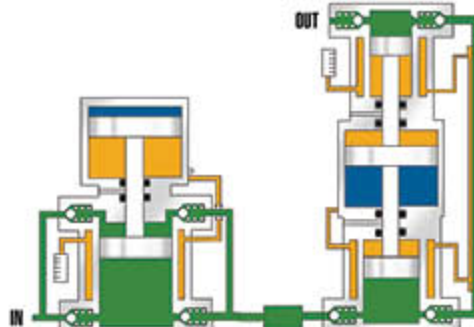
**Model AGD**  
Single Stage, Double Acting,  
Cooling Jackets



**Model AGT**  
Two Stage, Cooling Fins



**Model AGT**  
Two Stage, Cooling Jackets



**Model AGD-4 feeding into Model AGT-x/x**

**Multi stage - Two boosters.**  
More than one booster  
of the same ratio  
may be used for each stage.

*Blue=Compressed Air Yellow=Exhaust Drive Air Green=Gas Media*



**AG-50** High-ratio gas  
booster, single stage,  
single acting



**AGD-30** - Medium-ratio  
gas booster, single  
stage double acting,  
single air head



**AGT-30/75-** Two stage  
gas booster single air head,  
cooling jacket

## Metric Conversion Table

| Multiply | By     | To Obtain       |
|----------|--------|-----------------|
| PSI      | 0.0703 | Kg/Cm2          |
| SCFM     | 0.0283 | Cu. Meters/min. |
| Inches   | 25.4   | Millimeters     |
| Pounds   | 0.453  | Kilograms       |

# Selecting a Pneumatic Driven Gas Booster

Air driven gas boosters have seven significant operating parameters that determine their selection for any application. These are as follows:

1. Maximum discharge pressure?
2. Flowrate
  - a. Is it constant?
    - i. What is flowrate required?
  - b. Is it filling a vessel?
    - i. What is vessel size (water volume)?
    - ii. What is fill time required?
3. Supply
  - a. Is it at constant pressure?
  - b. Is it decreasing?
    - i. What is initial pressure?
    - ii. What is the minimum pressure?
4. Air drive pressure available?
5. Air drive volume available?
6. What is the gas?
7. What is the application?

The selection of the proper booster for any application starts with determining which booster "series" will provide the amount of flow and pressure required. The ability of the booster to *generate pressure* is a function of the drive pressure, multiplied by the nominal booster ratio. The ability to *generate flow* is a function of the quantity of air available to drive it, the displacement per cycle of the booster, and volumetric efficiency.

Within each booster series, there are standard materials of construction available. For applications involving aggressive gases, such as Hydrogen, Helium and CO<sub>2</sub>, some material substitutions are required.

Single Acting Single Stage "AG" boosters provide economical

means of boosting pressure for testing or small components and similar applications where volume is small and efficiency is not important. Control of maximum outlet pressure is accomplished with the use of an air drive pressure regulator. Maximum outlet pressure is drive area ratio multiplied by air pressure.

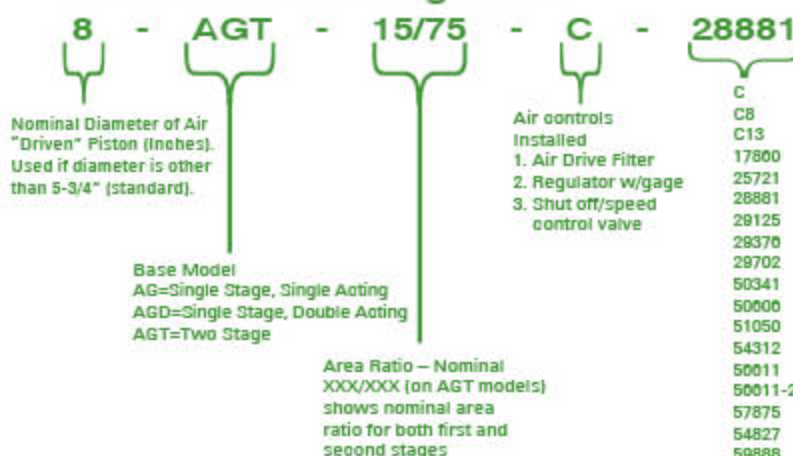
Double Acting Single Stage "AGD" boosters not only pump twice the volume of a Single Acting, Single Stage Booster per cycle, but also require less air drive since the inlet gas pressure is assisting the air drive in each direction, providing a substantial portion of the required driving force. These models provide efficient means of boosting large volumes of gas at low to medium compression ratios. Maximum outlet pressure is drive area ratio times air drive pressure PLUS gas supply pressure.

Two-Stage "AGT" boosters provide efficient means of boosting to a high gas compression ratio since the ratio per stage is low. Maximum outlet pressure with these models is drive area ratio multiplied by air drive pressure plus supply pressure multiplied by the area ratio of the two gas pistons.

Since these models have interconnected gas pistons, they multiply supply pressure during the "interstage" stroke by the area ratio of the two gas pistons. If supply pressure is too high, the booster may have "interstage stall" at an outlet pressure substantially less than that obtainable on the "output" stroke. This limitation does not apply if outlet pressure is less than the "maximum supply" times the area ratio of the two gas pistons. Remember, this condition only applies to two stage models.

Specific performance information for your application may be obtained by referring to the **Sample Performance Chart** on page 8 of this catalog, or from a Haskel distributor. To locate a Haskel distributor near you, view the Distribution link on our website at [www.haskel.com](http://www.haskel.com), or contact Haskel direct.

## Model Number Configuration



# Model Selection Chart

LEGEND:  $P_s$  = Gas Supply Pressure,  $P_a$  = Drive Pressure,  $P_o$  = Outlet Pressure

|                                      | Model Number   | Maximum Rated Gas Supply |                              | Min. Gas Supply Pressure |         | Maximum Rated Gas Outlet |                    |        |       |          |              | Static Outlet Stall Pressure Formula | Piston Displacement Per Cycle |  | Gas Inlet/Outlet Connections  | Weight<br>LB (KG) |
|--------------------------------------|----------------|--------------------------|------------------------------|--------------------------|---------|--------------------------|--------------------|--------|-------|----------|--------------|--------------------------------------|-------------------------------|--|---|-------------------|
|                                      |                |                          |                              |                          |         | Inert Gas                |                    | Oxygen |       | Hydrogen |              |                                      | Cu. In.                       | ML   |   |                   |
|                                      |                | PSIG                     | BAR                          | PSIG                     | BAR     | PSIG                     | BAR                | PSIG   | BAR   | PSIG     | BAR          |                                      |                               |  |   |                   |
| Single Acting Single Stage Model AG  | 4AG-25         | 4500                     | 310                          | 25                       | 1.7     | 4500                     | 310                | 4500   | 310   | N/A      | N/A          | 25 Pa                                | 1.23                          | 20.2   | 3/8" SAE Both Ports   | 12 (5)            |
|                                      | AG-4           | 1250                     | 86                           | ATM                      | ATM     | 1250                     | 86                 | 1250   | 86    | N/A      | N/A          | 4 Pa                                 | 10                            | 163.9  | 3/8" NPT Both Ports   | 25 (11)           |
|                                      | AG-7           | 1050                     | 72                           | 25                       | 1.7     | 1050                     | 72                 | 1050   | 72    | N/A      | N/A          | 7 Pa                                 | 13.2                          | 216.3  | 3/8" NPT Both Ports   | 30 (14)           |
|                                      | AG-15          | 2250                     | 155                          | 50                       | 3.5     | 2250                     | 155                | 2250   | 155   | N/A      | N/A          | 15 Pa                                | 6.2                           | 101.6  | Interchangeable 3-3/8" SAE or 1/4" H/P (BuTech) Both Ports              | 27 (12)           |
|                                      | AG-30          | 4500                     | 310                          | 100                      | 7       | 4500                     | 310                | 4500   | 310   | 4500     | 310          | 30 Pa                                | 3.1                           | 50.8   | Interchangeable 3-3/8" SAE or 1/4" H/P (BuTech) Both Ports              | 27 (12)           |
|                                      | AG-50          | 7500                     | 517                          | 100                      | 7       | 7500                     | 517                | 5000   | 345   | N/A      | N/A          | 50 Pa                                | 1.96                          | 32.1   | Interchangeable 3-3/8" SAE or 1/4" H/P (BuTech) Both Ports              | 27 (12)           |
|                                      | AG-62          | 9000                     | 620                          | 200                      | 14      | 9000                     | 620                | 5000   | 345   | 9000     | 620          | 60 Pa                                | 3.1                           | 50.8   | Interchangeable 3-3/8" SAE or 1/4" H/P (BuTech) Both Ports              | 35 (16)           |
|                                      | AG-75          | 11250                    | 775                          | 250                      | 17      | 11250                    | 775                | 5000   | 345   | 11250    | 775          | 75 Pa                                | 1.2                           | 19.6   | Interchangeable 3-3/8" SAE or 1/4" H/P (BuTech) Both Ports              | 27 (12)           |
|                                      | AG-102         | 7500                     | 517                          | 100                      | 7       | 15000                    | 1034               | 5000   | 345   | N/A      | N/A          | 100 Pa                               | 1.96                          | 32.1   | Interchangeable 3-3/8" SAE or 1/4" H/P (BuTech) Both Ports              | 35 (16)           |
|                                      | AG-152         | 20000                    | 1380                         | 250                      | 17      | 20000                    | 1380               | 5000   | 345   | 15000    | 1034         | 150 Pa                               | 1.2                           | 19.6   | Interchangeable 3-3/8" SAE or 1/4" H/P (BuTech) Both Ports              | 27 (12)           |
|                                      | AG-233         | 22500                    | 1551                         | 250                      | 17      | 22500                    | 1551               | N/A    | N/A   | N/A      | N/A          | 225 Pa                               | 1.2                           | 19.6   | Interchangeable 3-3/8" SAE or 1/4" H/P (BuTech) Both Ports              | 40 (18)           |
|                                      | AG-303         | 39000                    | 2690                         | 500                      | 34      | 39000                    | 2690               | N/A    | N/A   | N/A      | N/A          | 300 Pa                               | 0.89                          | 14.6   | 1/4" H/P (BuTech) both ports  | 44 (20)           |
| Double Acting Single Stage Model AGD | AGD-1.5        | 300                      | 21                           | ATM                      | ATM     | 300                      | 21                 | 300    | 21    | N/A      | N/A          | 1.5 Pa+Ps                            | 60                            | 983.2  | Inlet Port 3/4" NPT<br>Outlet Port 1/2" NPT                             | 44 (20)           |
|                                      | AGD-4          | 1250                     | 86                           | ATM                      | ATM     | 1250                     | 86                 | 1250   | 86    | N/A      | N/A          | 4 Pa+Ps                              | 19.3                          | 316.3  | 3/8" NPT Both Ports   | 31 (14)           |
|                                      | AGD-7          | 2500                     | 172                          | 25                       | 1.7     | 2500                     | 172                | 2500   | 172   | 2500     | 172          | 7 Pa+Ps                              | 26.4                          | 432.6  | Inlet Port: 3/8" NPT<br>Outlet Port: 3/8" NPT<br>2 ea./ inlet & outlet  | 35 (16)           |
|                                      | AGD-14         | 5000                     | 345                          | 25                       | 1.7     | 5000                     | 345                | 5000   | 345   | N/A      | N/A          | 14 Pa+Ps                             | 26.4                          | 432.6  | Inlet Port: 3/8" NPT<br>Outlet Port: 3/8" NPT                           | 49 (22)           |
|                                      | AGD-15         | 5000                     | 345                          | 50                       | 3.5     | 5000                     | 345                | 5000   | 345   | 4000     | 276          | 15 Pa+Ps                             | 12.4                          | 203.2  | Interchangeable 3-3/8" SAE or 1/4" H/P both Ports. 2 ea. inlet & outlet | 35 (16)           |
|                                      | AGD-30         | 9000                     | 620                          | 100                      | 7       | 9000                     | 620                | 5000   | 345   | 9000     | 620          | 30 Pa+Ps                             | 6.2                           | 101.6  | Interchangeable 3-3/8" SAE or 1/4" H/P both Ports. 2 ea. inlet & outlet | 38 (17)           |
|                                      | AGD-32         | 5000                     | 345                          | 50                       | 3.5     | 5000                     | 345                | 5000   | 345   | 4000     | 276          | 30 Pa+Ps                             | 12.4                          | 203.2  | Interchangeable 3-3/8" SAE or 1/4" H/P both Ports. 2 ea. inlet & outlet | 49 (22)           |
|                                      | AGD-50         | 15000                    | 1034                         | 100                      | 7       | 15000                    | 1034               | 5000   | 345   | N/A      | N/A          | 50 Pa+Ps                             | 3.9                           | 63.9   | Interchangeable 3-3/8" SAE or 1/4" H/P both Ports. 2 ea. inlet & outlet | 39 (18)           |
|                                      | AGD-62         | 5000                     | 345                          | 200                      | 14      | 9000                     | 620                | 5000   | 345   | 9000     | 620          | 60 Pa+Ps                             | 6.2                           | 101.6  | Interchangeable 3-3/8" SAE or 1/4" H/P both Ports. 2 ea. inlet & outlet | 49 (22)           |
|                                      | AGD-75         | 12000                    | 827                          | 250                      | 17      | 12000                    | 827                | 5000   | 345   | 15000    | 1034         | 75 Pa+Ps                             | 2.4                           | 39.3   | Interchangeable 3-3/8" SAE or 1/4" H/P both Ports. 2 ea. inlet & outlet | 39 (18)           |
|                                      | AGD-102        | 15000                    | 1034                         | 100                      | 7       | 15000                    | 1034               | 5000   | 345   | 15000    | 1034         | 100 Pa+Ps                            | 3.9                           | 63.9   | Interchangeable 3-3/8" SAE or 1/4" H/P both Ports. 2 ea. inlet & outlet | 49 (22)           |
|                                      | AGD-152        | 25000                    | 1724                         | 250                      | 17      | 25000                    | 1724               | N/A    | N/A   | 15000    | 1034         | 150 Pa+Ps                            | 2.4                           | 39.3   | Interchangeable 3-3/8" SAE or 1/4" H/P both Ports. 2 ea. inlet & outlet | 49 (22)           |
| Two Stage Model AGT                  | AGT-4          | 1250                     | 86                           | 1/4 ATM                  | 1/4 ATM | 1250                     | 86                 | 1250   | 86    | N/A      | N/A          | 4 Pa+Ps                              | 10                            | 164  | 3/8" NPT Both Ports   | 25 (11)           |
|                                      | AGT-7/15       | 0 Pa to 2500*            | 0 Pa to 172*                 | 25                       | 1.7     | 5000                     | 345                | 5000   | 345   | 4000     | 276          | 15 Pa+2 Ps                           | 13.2                          | 216.3  | Inlet Port: 3/8" NPT<br>Outlet Port: 3/8" SAE or 1/4" H/P (BuTech)      | 40 (18)           |
|                                      | AGT-7/30       | 2 Pa to 2500*            | 2 Pa to 172*                 | 25                       | 1.7     | 9000                     | 620                | 5000   | 345   | 9000     | 620          | 30 Pa+4 Ps                           | 13.2                          | 216.3  | Inlet Port: 3/8" NPT<br>Outlet Port: 3/8" SAE or 1/4" H/P (BuTech)      | 41 (19)           |
|                                      | AGT-14/32      | 12 Pa to 2500*           | 12 Pa to 172*                | 25                       | 1.7     | 5000                     | 345                | 5000   | 345   | 4000     | 276          | 30 Pa+2 Ps                           | 13.2                          | 216.3  | Inlet Port: 3/8" NPT<br>Outlet Port: 3/8" SAE or 1/4" H/P (BuTech)      | 46 (21)           |
|                                      | AGT-14/62      | 4 Pa to 2500*            | 4 Pa to 172*                 | 25                       | 1.7     | 9000                     | 620                | 5000   | 345   | 9000     | 620          | 60 Pa+4 Ps                           | 13.2                          | 216.3  | Inlet Port: 3/8" NPT<br>Outlet Port: 3/8" SAE or 1/4" H/P (BuTech)      | 41 (19)           |
|                                      | AGT-15/30      | 15 Pa to 2500*           | 15 Pa to 172*<br>5000* (345) | 50                       | 3.5     | 9000                     | 620<br>5000* (345) | 5000   | 345   | 9000     | 620          | 30 Pa+2 Ps                           | 6.2                           | 101.6  | Interchangeable 3/8" SAE or 1/4" H/P (BuTech) Both Ports                | 39 (18)           |
| AGT-15/50                            | 65 Pa to 5000* | 6.5 Pa to 345*           | 100                          | 7                        | 15000   | 1034                     | 5000               | 345    | 15000 | 1034     | 50 Pa+3.3 Ps | 6.2                                  | 102                           | Interchangeable 3-3/8" SAE or 1/4" H/P (BuTech) Both Ports | 38 (17)   |                   |

|   | Model Number  | Maximum Rated Gas Supply                                |                            | Min. Gas Supply Pressure |       | Maximum Rated Gas Outlet |      |        |     |          |           | Static Outlet Stall Pressure Formula | Piston Displacement Per Cycle |                              | Gas Inlet/Outlet Connections                              | Weight LB (KG) |
|---|---------------|---|----------------------------|--------------------------|-------|--------------------------|------|--------|-----|----------|-----------|--------------------------------------|-------------------------------|------------------------------|---|----------------|
|   |               |   |                            |                          |       | Inert Gas                |      | Oxygen |     | Hydrogen |           |                                      | Cu. In.                       | ML                           |   |                |
|   |               | PSIG  | BAR                        | PSIG                     | BAR   | PSIG                     | BAR  | PSIG   | BAR | PSIG     | BAR       |                                      |                               |                              |   |                |
| Two Stage Model AGT                     | AGT-15/75     | 3.5 Pa to 5000 <sup>1</sup>                             | 3.5 Pa to 345 <sup>2</sup> | 100                      | 7     | 15000                    | 1034 | 5000   | 345 | 15000    | 1034      | 75 Pa+5 Ps                           | 6.2                           | 101.6                        | Interchangeable 3/8"SAE or 1/4" H/P (BuTech) Both Ports   | 39 (18)        |
|   | AGT-30/50     | 45 Pa to 9000 <sup>1</sup>                              | 45 Pa to 620 <sup>2</sup>  | 100                      | 7     | 15000                    | 1034 | 5000   | 345 | 15000    | 1034      | 50 Pa+1.6 Ps                         | 3.1                           | 50.8                         | Interchangeable 3-3/8"SAE or 1/4" H/P (BuTech) Both Ports | 38 (17)        |
|   | AGT-30/75     | 20 Pa to 9000 <sup>1</sup>                              | 20 Pa to 620 <sup>2</sup>  | 100                      | 7     | 15000                    | 1034 | 5000   | 345 | 15000    | 1034      | 75 Pa+2.5 Ps                         | 3.1                           | 50.8                         | Interchangeable 3-3/8"SAE or 1/4" H/P (BuTech) Both Ports | 39 (18)        |
|   | AGT-32/62     | 30 Pa to 2500 <sup>1</sup><br>5000 <sup>2</sup> (345)   | 30 Pa to 172 <sup>2</sup>  | 100                      | 7     | 9000                     | 620  | 5000   | 345 | 9000     | 620       | 80 Pa+2 Ps                           | 6.2                           | 101.6                        | Interchangeable 3/8"SAE or 1/4" H/P (BuTech) Both Ports   | 49 (22)        |
|   | AGT-32/102    | 13 Pa to 9000 <sup>1</sup>                              | 13 Pa to 620 <sup>2</sup>  | 100                      | 7     | 15000                    | 1034 | 5000   | 345 | 15000    | 1034      | 75 Pa+3.3 Ps                         | 6.2                           | 101.6                        | Interchangeable 3/8"SAE or 1/4" H/P (BuTech) Both Ports   | 49 (22)        |
|   | AGT-32/152    | 7 Pa to 5000 <sup>1</sup>                               | 7 Pa to 345 <sup>2</sup>   | 100                      | 7     | 15000                    | 1034 | 5000   | 345 | 15000    | 1034      | 150 Pa+5 Ps                          | 6.2                           | 101.6                        | Interchangeable 3/8"SAE or 1/4" H/P (BuTech) Both Ports   | 39 (18)        |
|   | AGT-62/102    | 90 Pa to 9000 <sup>1</sup>                              | 90 Pa to 620 <sup>2</sup>  | 100                      | 7     | 15000                    | 1034 | 5000   | 345 | 15000    | 1034      | 100 Pa+1.6 Ps                        | 3.1                           | 50.8                         | Interchangeable 3/8"SAE or 1/4" H/P (BuTech) Both Ports   | 39 (18)        |
|   | AGT-62/152    | 40 Pa to 3000 <sup>1</sup><br>9000 <sup>2</sup> (621)   | 40 Pa to 248 <sup>2</sup>  | 100                      | 7     | 20000                    | 1379 | N/A    | N/A | 15000    | 1034      | 150 Pa+2.5 Ps                        | 3.1                           | 50.8                         | Interchangeable 3/8"SAE or 1/4" H/P (BuTech) Both Ports   | 49 (22)        |
|   | AGT-62/152H   | 40 Pa to 3000 <sup>1</sup><br>9000 <sup>2</sup> (621)   | 40 Pa to 248 <sup>2</sup>  | 100                      | 7     | 25000                    | 1723 | N/A    | N/A | N/A      | N/A       | 150 Pa+2.5 Ps                        | 3.1                           | 50.8                         | Interchangeable 3/8"SAE or 1/4" H/P (BuTech) Both Ports   | 51 (23)        |
| Double Acting Single Stage 8" Model AGD | 8AGD-1        | 300   | 21                         | ATM                      | ATM   | 300                      | 21   | 300    | 21  | N/A      | N/A       | 1.5 Pa+Ps                            | 400                           | 6554.8                       | 3/4" NPT Both Ports                                       | 121 (55)       |
|   | 8AGD-2        | 300   | 21                         | ATM                      | ATM   | 300                      | 21   | 300    | 21  | N/A      | N/A       | 2 Pa+Ps                              | 200                           | 3277                         | 3/4" NPT Both Ports                                       | 121 (55)       |
|   | 8AGD-2.8      | 800   | 55                         | ATM                      | ATM   | 800                      | 55   | 800    | 55  | N/A      | N/A       | 2.8 Pa+Ps                            | 125                           | 2048                         | 1/2" NPT (2 ea) Inlet/Outlet Ports                        | 121 (55)       |
|   | 8AGD2-2.8     | 800   | 55                         | ATM                      | ATM   | 800                      | 55   | 800    | 55  | N/A      | N/A       | 2.8 Pa+Ps                            | 125                           | 2048                         | 1/2" NPT (2 ea) Inlet/Outlet Ports                        | 156 (71)       |
|   | 8AGD-5        | 2500  | 172                        | 50                       | 3.5   | 2500                     | 172  | 2500   | 172 | N/A      | N/A       | 5 Pa+Ps                              | 71.4                          | 1170                         | Inlet Port 3/4" NPT<br>Outlet Port 1/2" NPT               | 121 (55)       |
|   | 8AGD-14       | 5000  | 345                        | 50                       | 3.5   | 5000                     | 345  | 5000   | 345 | 5000     | 345       | 14 Pa+Ps                             | 26.7                          | 437.5                        | Inlet Port 3/4" NPT<br>Outlet Port 1/2" NPT               | 121 (55)       |
|   | 8AGD-30       | 5000  | 345                        | 50                       | 3.5   | 5000                     | 345  | 5000   | 345 | 5000     | 345       | 30 Pa+Ps                             | 12.4                          | 203.2                        | 1/4" NPT Both Ports                                       | 121 (55)       |
|   | 8AGD-60       | 9000  | 620                        | 50                       | 3.5   | 9000                     | 620  | 5000   | 345 | 9000     | 345       | 60 Pa+Ps                             | 6.2                           | 101.6                        | 1/4" NPT Inlet Port, 1/4" HP (BuTech) Port Outlet         | 121 (55)       |
|   | 8AGD-150      | 20000   | 1378                       | 50                       | 3.5   | 20000                    | 1378 | 5000   | 345 | N/A      | N/A       | 150 Pa+Ps                            | 2.4                           | 39.3                         | 1/4" H/P (BuTech) Both Ports                              | 121 (55)       |
| Two Stage AGT Series 8" & 14" Model AGT | 8AGT-5/14     | 2.8 Pa to 2500 <sup>1</sup>                             | 2.8 Pa to 172 <sup>2</sup> | 25                       | 1.7   | 2500                     | 172  | 2500   | 172 | N/A      | N/A       | 14 Pa+2.8 Ps                         | 35.7                          | 585                          | Inlet Port 1/2" NPT<br>Outlet Port 1/4" NPT               | 121 (55)       |
|   | 8AGT-5/30     | 1 Pa to 2500 <sup>1</sup>                               | 1 Pa to 172 <sup>2</sup>   | 25                       | 1.7   | 5000                     | 345  | 5000   | 345 | N/A      | N/A       | 30 Pa+6 Ps                           | 35.7                          | 585                          | Inlet Port 1/2" NPT<br>Outlet Port 1/4" NPT               | 121 (55)       |
|   | 8AGT-14/30    | 12 Pa to 1190 <sup>1</sup><br>2500 <sup>2</sup> (172)   | 12 Pa to 82 <sup>2</sup>   | 25                       | 1.7   | 5000                     | 345  | 5000   | 345 | 4000     | 276       | 30 Pa+2.1 Ps                         | 13.2                          | 216.3                        | Inlet Port 3/8" NPT<br>Outlet Port 1/4" NPT               | 121 (55)       |
|   | 8AGT-14/60    | 4.3 Pa to 2500 <sup>1</sup>                             | 4.3 Pa to 172 <sup>2</sup> | 25                       | 1.7   | 9000                     | 620  | 5000   | 345 | N/A      | N/A       | 60 Pa+4.3 Ps                         | 13.2                          | 216.3                        | 3/8" NPT Inlet Port<br>1/4" HP (BuTech) Port Outlet       | 121 (55)       |
|   | 8AGT-30/60    | 30 Pa to 2500 <sup>1</sup><br>5000 <sup>2</sup> (345)   | 30 Pa to 172 <sup>2</sup>  | 25                       | 1.7   | 9000                     | 620  | 5000   | 345 | 9000     | 620       | 80 Pa+2 Ps                           | 6.2                           | 101.6                        | 1/4" NPT Inlet Port<br>1/4" HP (BuTech) Port Outlet       | 121 (55)       |
|   | 8AGT-60/150   | 40 Pa to 3000 <sup>1</sup><br>9000 <sup>2</sup> (621)   | 40 Pa to 248 <sup>2</sup>  | 25                       | 1.7   | 20000                    | 1378 | N/A    | N/A | N/A      | N/A       | 150 Pa+2.5 Ps                        | 3.1                           | 50.8                         | 1/4" NPT Inlet Port<br>1/4" HP (BuTech) Port Outlet       | 121 (55)       |
|   | 14AGT-125/315 | 82 Pa to 9000 <sup>1</sup><br>15000 <sup>2</sup> (1034) | 82 Pa to 414 <sup>2</sup>  | 1000                     | 6.9   | 35000                    | 2413 | N/A    | N/A | N/A      | N/A       | 315 Pa+2.5 Ps                        | 4.44                          | 72.8                         | 3/8" H/P (BuTech) Both Ports                              | 154 (70)       |
| 14AGD-315                               | 35000         | 2413  | 1000                       | 6.9                      | 35000 | 2413                     | N/A  | N/A    | N/A | N/A      | 315 Pa+Ps | 3.53                                 | 57                            | 3/8" H/P (BuTech) Both Ports | 154 (70)  |                |

1. Two-stage model: Supply pressure also limited by factor x air drive (Pa) to avoid interstage stall

2. If outlet pressure exceeds Maximum 1st stage pressure and supply pressure simultaneously exceeds pressure limit above the line, install interstage relief valve set at this pressure.

#### Port Information and Additional Notes

- Air Drive Inlet Port = 1/2" FNPT all 4" & 5 3/4" Models
- Air Drive Inlet Port = 3/4" FNPT all 8" & 14" Models
- Refer to pages 19-32 for dimensional drawings of all models
- 20 psi minimum air drive pressure for all units
- Maximum air drive is 150 psig all models except AG-233, AG-303, AGD-1.5(130 psig)
- 130 psig maximum drive pressure for all 8" and 14" models.
- Gas Boosters for Hydrogen applications must be specifically certified for use in Hydrogen Application
- Each two stage Gas Booster has a maximum allowable inlet gas pressure to avoid a condition known as "Interstage Stall." Refer to the Knowledge Library link on the Haskel website, [www.haskel.com](http://www.haskel.com), for a detailed explanation.

#### Suggested Cycling Speeds for Maximizing Seal Life

|                     |        |
|---------------------|--------|
| AG, AGD, AGT Series | 60 CPM |
| 8AG, 8AGT Series    | 50 CPM |
| 14AGD, 14AGT Series | 40 CPM |

Refer to pages 18-32 for dimensional drawings of all models.

# Sample Gas Booster Flow Rate Performance (SCFM)

## Flow and Pressure Performance:

Sample performance shown below is used for general reference only; consult Haskel Technical Sales or your Haskel Representative for specific performance information.

Cubic Meters Per Minute = SCFM x 0.0283

| Catalog Number | PA=90 psi |       |       |      |
|----------------|-----------|-------|-------|------|
|                | Qa        | Ps    | Po    | Q    |
| AG-4           | 25        | 200   | 300   | 6.2  |
|                | 25        | 120   | 300   | 3.8  |
|                | 25        | 80    | 300   | 2.3  |
|                | 25        | 40    | 300   | 1    |
| AG-7           | 21        | 240   | 800   | 3.4  |
|                | 21        | 180   | 800   | 2.5  |
|                | 21        | 120   | 800   | 1.8  |
|                | 21        | 80    | 800   | 0.7  |
| AG-15          | 30        | 800   | 1200  | 6.2  |
|                | 30        | 500   | 1200  | 5.1  |
|                | 30        | 400   | 1200  | 4    |
|                | 30        | 300   | 1200  | 3    |
| AG-30          | 40        | 1300  | 2000  | 9.4  |
|                | 40        | 1000  | 2000  | 7.2  |
|                | 40        | 700   | 2000  | 4.9  |
|                | 40        | 400   | 2000  | 2.8  |
| AG-50          | 35        | 1700  | 4000  | 8    |
|                | 35        | 1300  | 4000  | 4.5  |
|                | 35        | 900   | 4000  | 3    |
|                | 35        | 500   | 4000  | 1.7  |
| AG-62          | 25        | 2000  | 5000  | 5.2  |
|                | 25        | 1500  | 5000  | 3.9  |
|                | 25        | 1000  | 5000  | 2.5  |
|                | 25        | 500   | 5000  | 1.1  |
| AG-75          | 30        | 2000  | 6000  | 3.8  |
|                | 30        | 1500  | 6000  | 2.9  |
|                | 30        | 1000  | 6000  | 1.8  |
|                | 30        | 500   | 6000  | 0.8  |
| AG-102         | 32        | 4000  | 8000  | 8.5  |
|                | 32        | 3000  | 8000  | 8    |
|                | 32        | 2000  | 8000  | 4    |
|                | 32        | 1000  | 8000  | 2    |
| AG-152         | 20        | 8500  | 13000 | 3.8  |
|                | 20        | 5000  | 13000 | 3    |
|                | 20        | 3500  | 13000 | 2.3  |
|                | 20        | 2000  | 13000 | 1.3  |
| AG-233         | 20        | 10000 | 20000 | 3.2  |
|                | 20        | 8000  | 20000 | 2.8  |
|                | 20        | 6000  | 20000 | 2.4  |
|                | 20        | 4000  | 20000 | 1.8  |
| AG-303         | 40        | 12500 | 24000 | 6    |
|                | 40        | 10000 | 24000 | 5    |
|                | 40        | 7500  | 24000 | 3.5  |
|                | 40        | 5000  | 24000 | 2.5  |
| AGD-1.5        | 30        | 100   | 200   | 18.2 |
|                | 30        | 75    | 180   | 15.1 |
|                | 30        | 50    | 140   | 10   |
|                | 30        | 25    | 100   | 6.2  |
| AGD-4          | 30        | 500   | 800   | 33   |
|                | 30        | 350   | 800   | 25.4 |
|                | 30        | 200   | 400   | 18   |
|                | 30        | 50    | 200   | 4.5  |
| AGD-7          | 30        | 700   | 1300  | 18   |
|                | 30        | 500   | 1000  | 18.8 |
|                | 30        | 300   | 800   | 11.2 |
|                | 30        | 100   | 500   | 4    |
| AGD-14         | 48        | 2100  | 3000  | 80   |
|                | 40        | 1500  | 2500  | 48.4 |
|                | 32        | 900   | 2000  | 22.5 |
|                | 40        | 300   | 1000  | 10.4 |
| AGD-15         | 40        | 2100  | 3000  | 50.3 |
|                | 40        | 1500  | 2400  | 36.1 |
|                | 40        | 900   | 1800  | 21.5 |
|                | 40        | 300   | 1200  | 6.7  |
| AGD-30         | 40        | 2850  | 4200  | 35.8 |
|                | 40        | 2250  | 4200  | 25.5 |
|                | 40        | 1550  | 3200  | 19   |
|                | 40        | 850   | 2800  | 9.8  |
| AGD-32         | 50        | 2950  | 4400  | 57.7 |
|                | 40        | 2250  | 4400  | 33.2 |
|                | 28        | 1550  | 4000  | 15.4 |
|                | 33        | 850   | 3200  | 9.7  |
| AGD-50         | 50        | 3000  | 6000  | 24   |
|                | 50        | 2300  | 6000  | 12   |
|                | 45        | 1800  | 5000  | 10   |
|                | 30        | 900   | 5000  | 4    |

| Catalog Number | PA=90 psi |       |       |      |
|----------------|-----------|-------|-------|------|
|                | Qa        | Ps    | Po    | Q    |
| AGD-62         | 50        | 4000  | 7500  | 35.6 |
|                | 41        | 3250  | 7500  | 23.6 |
|                | 25        | 2500  | 7500  | 11   |
|                | 45        | 1000  | 5000  | 8    |
| AGD-75         | 45        | 5000  | 10000 | 21.5 |
|                | 45        | 3000  | 8000  | 14.3 |
|                | 50        | 2000  | 8000  | 11.3 |
|                | 50        | 1000  | 5000  | 5.5  |
| AGD-102        | 52        | 8000  | 12000 | 28   |
|                | 52        | 6000  | 12000 | 20   |
|                | 52        | 4000  | 10000 | 16   |
|                | 35        | 2000  | 10000 | 8    |
| AGD-152        | 40        | 11000 | 22000 | 19.1 |
|                | 25        | 7000  | 20000 | 6.6  |
|                | 40        | 5000  | 18000 | 12.1 |
|                | 52        | 3000  | 12000 | 10.7 |
| AGD-152H       | 30        | 12000 | 24000 | 15.5 |
|                | 40        | 10000 | 21000 | 18.3 |
|                | 40        | 7000  | 18000 | 15   |
|                | 40        | 5000  | 16000 | 12.1 |
| AGT-4          | 20        | 100   | 400   | 2.7  |
|                | 20        | 75    | 400   | 2    |
|                | 20        | 25    | 200   | 1.2  |
|                | 20        | 5     | 200   | 0.55 |
| AGT-7/15       | 35        | 200   | 1500  | 4.4  |
|                | 25        | 120   | 1500  | 1.8  |
|                | 35        | 80    | 1000  | 2.1  |
|                | 35        | 40    | 1000  | 1.1  |
| AGT-7/30       | 32        | 150   | 3000  | 2.8  |
|                | 40        | 100   | 2500  | 2.3  |
|                | 40        | 75    | 2000  | 1.9  |
|                | 40        | 50    | 2000  | 1.2  |
| AGT-14/32      | 54        | 400   | 3000  | 5.8  |
|                | 58        | 240   | 3000  | 3.7  |
|                | 54        | 200   | 2400  | 3    |
|                | 58        | 160   | 2000  | 2.8  |
| AGT-14/62      | 54        | 350   | 6000  | 5.0  |
|                | 56        | 275   | 5000  | 4.2  |
|                | 54        | 175   | 4000  | 2.8  |
|                | 58        | 125   | 4000  | 2.4  |
| AGT-15/30      | 40        | 900   | 4000  | 9.7  |
|                | 40        | 500   | 3000  | 5.8  |
|                | 40        | 300   | 2000  | 3.9  |
|                | 40        | 100   | 2000  | 1.2  |
| AGT-15/50      | 42        | 400   | 5000  | 3.7  |
|                | 42        | 250   | 5000  | 2.3  |
|                | 55        | 150   | 4000  | 2    |
|                | 55        | 100   | 4000  | 1.2  |
| AGT-15/75      | 48        | 230   | 6000  | 2.7  |
|                | 42        | 150   | 6000  | 1.4  |
|                | 55        | 110   | 4000  | 1.5  |
|                | 55        | 70    | 4000  | 0.8  |
| AGT-30/50      | 50        | 850   | 5000  | 6    |
|                | 50        | 600   | 5000  | 3.5  |
|                | 82        | 350   | 4000  | 2    |
|                | 82        | 100   | 4000  | 0.8  |
| AGT-30/75      | 48        | 1300  | 8000  | 8.4  |
|                | 25        | 700   | 8000  | 2.3  |
|                | 45        | 400   | 6000  | 2.4  |
|                | 55        | 100   | 4000  | 0.89 |
| AGT-32/62      | 45        | 1700  | 7500  | 14.3 |
|                | 28        | 1300  | 7500  | 6.7  |
|                | 58        | 900   | 5000  | 9.8  |
|                | 45        | 500   | 5000  | 4.3  |
| AGT-32/102     | 35        | 1200  | 9500  | 5.1  |
|                | 45        | 600   | 9500  | 3.3  |
|                | 48        | 550   | 8500  | 3.3  |
|                | 58        | 375   | 8500  | 2.8  |
| AGT-32/152     | 23        | 450   | 15000 | 1.6  |
|                | 52        | 250   | 10000 | 2.1  |
|                | 50        | 150   | 10000 | 1    |
|                | 55        | 50    | 3000  | 0.46 |
| AGT-62/102     | 55        | 1600  | 10000 | 6    |
|                | 55        | 1200  | 10000 | 4.5  |
|                | 50        | 800   | 10000 | 3    |
|                | 60        | 400   | 9000  | 1.5  |

| Catalog Number | PA=90 psi |       |       |      |
|----------------|-----------|-------|-------|------|
|                | Qa        | Ps    | Po    | Q    |
| AGT-62/152     | 30        | 2400  | 18000 | 6.6  |
|                | 35        | 1400  | 15000 | 4.6  |
|                | 47        | 900   | 12000 | 4    |
|                | 51        | 400   | 10000 | 1.8  |
| AGT-62/152H    | 23        | 2500  | 19000 | 4.8  |
|                | 25        | 1800  | 17000 | 4.1  |
|                | 20        | 1200  | 16000 | 2    |
|                | 20        | 800   | 15000 | 1.3  |
| 8AGD-1         | 75        | 130   | 180   | 128  |
|                | 75        | 110   | 180   | 81   |
|                | 75        | 90    | 180   | 76   |
|                | 75        | 70    | 140   | 60   |
| 8AGD-2         | 75        | 130   | 250   | 56   |
|                | 75        | 110   | 200   | 55   |
|                | 75        | 90    | 200   | 41   |
|                | 75        | 70    | 200   | 29   |
| 8AGD-2.8       | 70        | 500   | 700   | 109  |
|                | 70        | 300   | 500   | 65   |
|                | 90        | 200   | 400   | 55   |
|                | 90        | 100   | 300   | 28   |
| 8AGD2-2.8      | 100       | 500   | 700   | 215  |
|                | 100       | 300   | 500   | 131  |
|                | 125       | 200   | 400   | 106  |
|                | 125       | 100   | 300   | 54   |
| 8AGD-5         | 70        | 600   | 900   | 96   |
|                | 70        | 450   | 800   | 86   |
|                | 85        | 300   | 700   | 37   |
|                | 85        | 100   | 500   | 12   |
| 8AGD-14        | 75        | 1000  | 2000  | 55   |
|                | 75        | 800   | 1800  | 44   |
|                | 75        | 500   | 1200  | 33   |
|                | 75        | 200   | 1000  | 11   |
| 8AGD-30        | 75        | 2500  | 4000  | 78   |
|                | 75        | 1800  | 3500  | 52   |
|                | 75        | 1200  | 2800  | 36   |
|                | 85        | 600   | 1800  | 18   |
| 8AGD-60        | 75        | 4000  | 7500  | 53   |
|                | 75        | 2800  | 6800  | 36   |
|                | 75        | 1800  | 5200  | 28   |
|                | 85        | 1000  | 3800  | 14   |
| 8AGD-150       | 75        | 10000 | 18000 | 38   |
|                | 75        | 8000  | 16000 | 33   |
|                | 75        | 6000  | 14000 | 28   |
|                | 85        | 4000  | 12000 | 20   |
| 8AGT-5/14      | 75        | 150   | 1200  | 12   |
|                | 70        | 90    | 1000  | 8    |
|                | 50        | 60    | 600   | 6    |
|                | 40        | 30    | 400   | 3    |
| 8AGT-5/30      | 60        | 60    | 2800  | 1.4  |
|                | 75        | 40    | 2400  | 0.7  |
|                | 75        | 30    | 1800  | 0.9  |
|                | 75        | 20    | 1500  | 0.5  |
| 8AGT-14/30     | 75        | 700   | 3500  | 19.7 |
|                | 75        | 400   | 3000  | 10.4 |
|                | 75        | 250   | 2500  | 8.8  |
|                | 75        | 100   | 1800  | 2.7  |
| 8AGT-14/60     | 57        | 250   | 6000  | 3.7  |
|                | 75        | 200   | 5500  | 3.5  |
|                | 75        | 100   | 4500  | 1.2  |
|                | 75        | 50    | 3000  | 0.31 |
| 8AGT-30/60     | 75        | 1700  | 7500  | 23   |
|                | 75        | 1300  | 6800  | 17   |
|                | 75        | 900   | 5000  | 13.8 |
|                | 75        | 500   | 4000  | 7.8  |
| 8AGT-60/150    | 71        | 2500  | 18000 | 14.2 |
|                | 75        | 1500  | 15000 | 9.4  |
|                | 75        | 1000  | 12000 | 7    |
|                | 75        | 500   | 8000  | 4    |
| 14AGD-315      | 150       | 16000 | 32000 | 25.3 |
|                | 150       | 13000 | 28000 | 23   |
|                | 150       | 9000  | 24000 | 18.1 |
|                | 150       | 5000  | 18000 | 10.2 |
| 14AGT-125/315  | 115       | 4100  | 32000 | 14.9 |
|                | 133       | 3100  | 28000 | 13   |
|                | 150       | 2200  | 24000 | 10   |
|                | 150       | 1000  | 18000 | 4.2  |
| 4AG-25         | 2         | 2000  | 2250  | 0.75 |
|                | 2         | 1500  | 2250  | 0.6  |
|                | 2         | 1000  | 2250  | 0.5  |
|                | 2         | 500   | 2250  | 0.2  |

**LEGEND**  
**Pa** = Air Drive Pressure  
**Ps** = Gas Supply Pressure  
**Qa** = Air Drive Quantity  
**Po** = Gas Outlet Pressure  
**Q** = Gas Outlet Flow Rate



# Alternative Gas Booster and System Models

## Specialty Gas Booster Models

| Standard Model Number | Oxygen Booster Model Number | Hydrogen Booster Model Number | Standard Model Number | Oxygen Booster Model Number | Hydrogen Booster Model Number |
|-----------------------|-----------------------------|-------------------------------|-----------------------|-----------------------------|-------------------------------|
| 4AG-25                | 86921                       |                               | AGT-15/50             |                             |                               |
| AG-4                  | 28596                       |                               | AGT-15/75             | 28595                       | 86993                         |
| AG-7                  | 29618                       |                               | AGT-30/50             | 86915                       |                               |
| AG-15                 | 28598                       |                               | AGT-30/75             | 17599                       | 86994                         |
| AG-30                 | 17445                       | 87083                         | AGT-32/62             | 27267                       | 86995                         |
| AG-50                 | 86911                       |                               | AGT-32/102            |                             |                               |
| AG-62                 | 17436                       | 86979                         | AGT-32/152            |                             |                               |
| AG-75                 | 17418                       | 86980                         | AGT-62/102            |                             |                               |
| AG-102                | 86912                       |                               | AGT-62/152            |                             |                               |
| AG-152                | 29677                       | 86981                         | AGT-62/152H           | 26180                       |                               |
| AG-233                |                             |                               | 8AGD-1                | 58808                       |                               |
| AG-303                |                             |                               | 8AGD-2                | 58675                       | 59060                         |
| AGD-1.5               | 52618                       |                               | 8AGD-2.8              | 80642                       |                               |
| AGD-4                 | 26266                       |                               | 8AGD2-2.8             |                             |                               |
| AGD-7                 | 51147                       | 86982                         | 8AGD-5                | 52623                       |                               |
| AGD-14                | 83008                       |                               | 8AGD-14               | 52612                       | 87218                         |
| AGD-15                | 27962                       | 86983                         | 8AGD-30               | 52619                       | 87201                         |
| AGD-30                | 17495                       | 86984                         | 8AGD-60               | 80867                       | 87185                         |
| AGD-32                | 52570                       | 86985                         | 8AGD-150              |                             |                               |
| AGD-50                | 86913                       |                               | 8AGT-5/14             | 52624                       |                               |
| AGD-62                | 27961                       | 86986                         | 8AGT-5/30             | 52630                       |                               |
| AGD-75                | 51269                       | 86987                         | 8AGT-14/30            | 52622                       |                               |
| AGD-102               | 86914                       |                               | 8AGT-14/60            |                             |                               |
| AGD-152               |                             | 86988                         | 8AGT-30/60            | 58979                       |                               |
| AGT-4                 | 28597                       |                               | 8AGT-60/150           |                             |                               |
| AGT-7/15              | 51308                       | 86989                         | 14AGD-315             |                             |                               |
| AGT-7/30              | 52065                       | 86990                         | 14AGT-125/315         |                             |                               |
| AGT-14/32             |                             |                               |                       |                             |                               |
| AGT-14/62             |                             | 83007                         |                       |                             |                               |
| AGT-15/30             | 28007                       | 86992                         |                       |                             |                               |

## Inert Gas Booster System Models

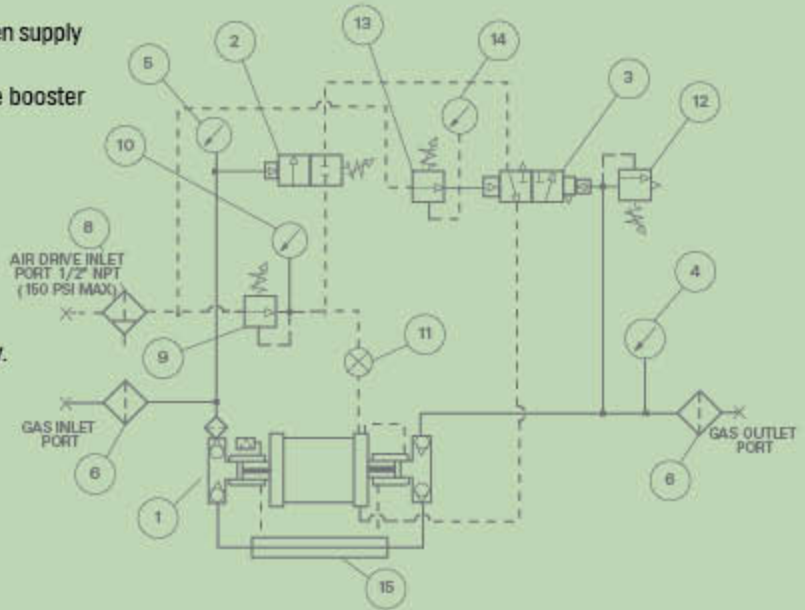
| Standard Model Number | Standard System Model Number | Oxygen System Model Number | Standard Model Number | Standard System Model Number | Oxygen System Model Number |
|-----------------------|------------------------------|----------------------------|-----------------------|------------------------------|----------------------------|
| 4AG-25                | 87114                        | 82880                      | AGT-15/50             |                              |                            |
| AG-4                  |                              |                            | AGT-15/75             | 53748                        | 53796                      |
| AG-7                  |                              |                            | AGT-30/50             |                              |                            |
| AG-15                 |                              |                            | AGT-30/75             | 52031                        | 53742                      |
| AG-30                 |                              |                            | AGT-32/62             | 29498                        | 53150                      |
| AG-50                 |                              |                            | AGT-32/102            |                              |                            |
| AG-62                 |                              |                            | AGT-32/152            | 80509                        |                            |
| AG-75                 |                              |                            | AGT-62/102            |                              |                            |
| AG-102                |                              |                            | AGT-62/152            | 80511                        |                            |
| AG-152                |                              |                            | AGT-62/152H           | 80512                        |                            |
| AG-233                |                              |                            | 8AGD-1                |                              |                            |
| AG-303                |                              |                            | 8AGD-2                | 80413                        | 80533                      |
| AGD-1.5               | 80501                        | 80523                      | 8AGD-2.8              | 80414                        | 80534                      |
| AGD-4                 | 59933                        | 80524                      | 8AGD2-2.8             |                              |                            |
| AGD-7                 | 82101                        | 80525                      | 8AGD-5                | 80515                        | 80535                      |
| AGD-14                | 80502                        | 80526                      | 8AGD-14               | 80516                        | 80536                      |
| AGD-15                | 80503                        | 80527                      | 8AGD-30               | 80517                        | 80537                      |
| AGD-30                | 80504                        | 52341                      | 8AGD-60               | 81266                        |                            |
| AGD-32                | 80505                        | 80528                      | 8AGD-150              |                              |                            |
| AGD-50                |                              |                            | 8AGT-5/14             | 80518                        | 80538                      |
| AGD-62                | 80506                        | 80529                      | 8AGT-5/30             | 80519                        | 80539                      |
| AGD-75                | 80507                        | 80530                      | 8AGT-14/30            | 54895                        | 53398                      |
| AGD-102               |                              |                            | 8AGT-14/60            | 80520                        | 80540                      |
| AGD-152               | 80508                        |                            | 8AGT-30/60            | 56131                        | 80541                      |
| AGT-4                 | 80004                        | 80531                      | 8AGT-60/150           |                              |                            |
| AGT-7/15              | 54961                        | 80532                      | 14AGD-315             |                              |                            |
| AGT-7/30              | 53353                        | 53343                      | 14AGT-125/315         |                              |                            |
| AGT-14/32             |                              |                            |                       |                              |                            |
| AGT-14/62             | 85431                        |                            |                       |                              |                            |
| AGT-15/30             | 29068                        | 26968                      |                       |                              |                            |

# Inert Gas Booster Systems

Haskel's ability to incorporate and interface electronic controls into systems provides precise compression and control of gases.

## Standard system components are:

1. Booster with External Pilot Modification to enable use of external components to start/stop the booster.
2. Adjustable Air Pilot Switch (inlet) – used to stop the booster when supply pressure falls to adjusted set point.
3. Adjustable Remoteset Air Pilot Switch (outlet) – used to stop the booster when outlet pressure reaches adjusted set point.
4. Pressure Gauge indicates outlet boosted pressure.
5. Pressure Gauge indicates inlet gas pressure supply.
6. Gas Filter used to stop any ingested contamination from entering the booster (e.g. while changing out a gas supply bottle)
7. Roll Bar Frame (not shown) used for mounting booster and other components.
8. Air Filter - inline filter ( 20-40 micron) for maintaining air drive quality.
9. Adjustable Air Regulator used to set the Air Drive Pressure (0 - 150 psi max)
10. Air Pressure Gauge indicates the Air Drive Pressure
11. Manual On/Off Valve and Speed Control Valve used to adjust cycling speed that the booster cycles
12. Relief Valve used to protect the booster & other components from over pressurization
13. Adjustable Remoteset Pilot Regulator used to adjust the set point for the Remoteset Air Pilot Switch
14. Pressure Gauge used to indicate the Adjustable Remoteset Regulator adjusted pressure
15. Interstage Cooler – a tube & shell cooler used to reduce the boosted gas temperature (part of the booster)



29068 System Shown Above

## Charging Systems

Charging systems provide a fast, efficient and economical method of charging, or "topping up" gas pressures. Charging units ensure that the optimum use is made of commercially bottled gases down to as low as 150 psi or vaporized liquid (cryogenic) supplies while producing pressures as high as 39,000 psi depending on gas type. Units are standard or custom-built in a variety of configurations, samples of which are illustrated here.

### 26968 Oxygen Booster System

Oxygen booster systems for filling oxygen cylinders. An efficient, safe and economical system for oxygen handling.

- (A) Outlet stall (max gas outlet pressure is: Air drive psi x 30 Plus 2x gas inlet psi)
- (B) Interstage stall (Max gas inlet pressure is air drive psi x 15 if outlet exceeds air drive psi x 30. If it does not, max gas inlet is air drive psi x 30)
- (C) If less air flow is available, outlet gas rates will decrease about in proportion



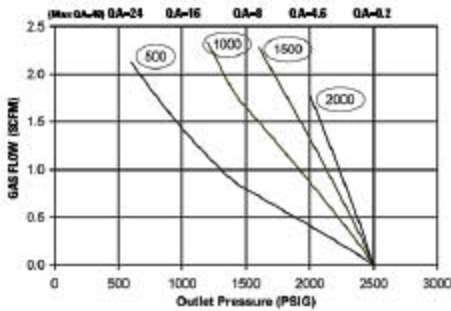
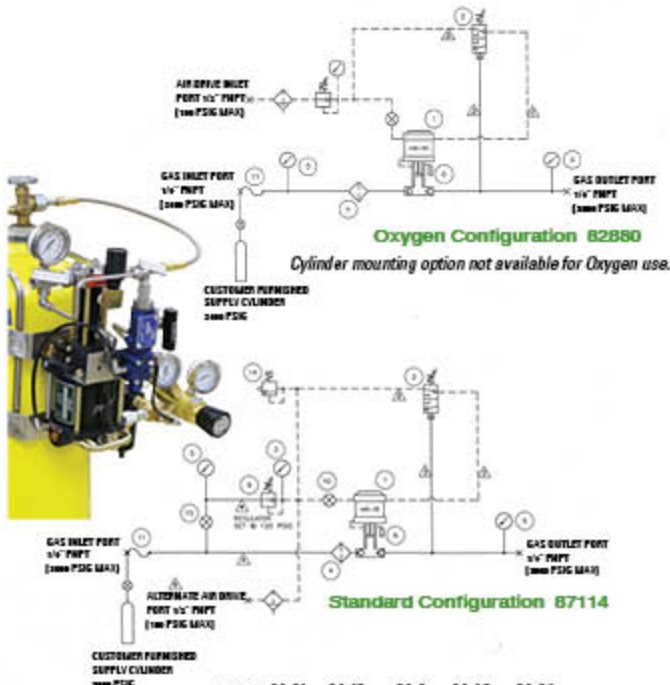
26968 Sample Performance

| Oxygen Gas Pressure - PSI |            | Oxygen Outlet Gas Flow - SCFM |      |      |
|---------------------------|------------|-------------------------------|------|------|
| Inlet                     | Outlet (B) | Air Drive PSI                 |      |      |
|                           |            | 60                            | 80   | 100  |
| 250                       | 1500       | 3.5                           | 4.0  | 4.0  |
| 250                       | 2000       | 2.1                           | 2.1  | 3.6  |
| 250                       | 3000       | (A)                           | (A)  | 2.5  |
| 1000                      | 1500       | 8.7                           | 14.7 | 15.0 |
| 1000                      | 2500       | (B)                           | 9.7  | 13.7 |
| 1000                      | 3500       | (B)                           | 9.6  | 13.6 |
| 1500                      | 2000       | (B)                           | 14.7 | 20.7 |
| 1500                      | 2500       | (B)                           | (B)  | 16.1 |
| 1500                      | 3000       | (B)                           | (B)  | (B)  |
| 2000                      | 2500       | (B)                           | (B)  | 21.6 |

Performance based on indicated Air Drive PSI @ 50 SCFM (C)

## Mini Charging Booster

Designed and Manufactured to achieve an affordable and effective gas transfer and charging unit. Standard configuration includes cylinder mounting bracket.



## ScubAmp

Used by Dive Shops to boost medium pressure breathing air from storage air direct to dive tanks to reach maximum fill pressure rapidly. With the use of a ScubAmp, existing air compressor systems can stay within their 200-2500 psi normal operating range.

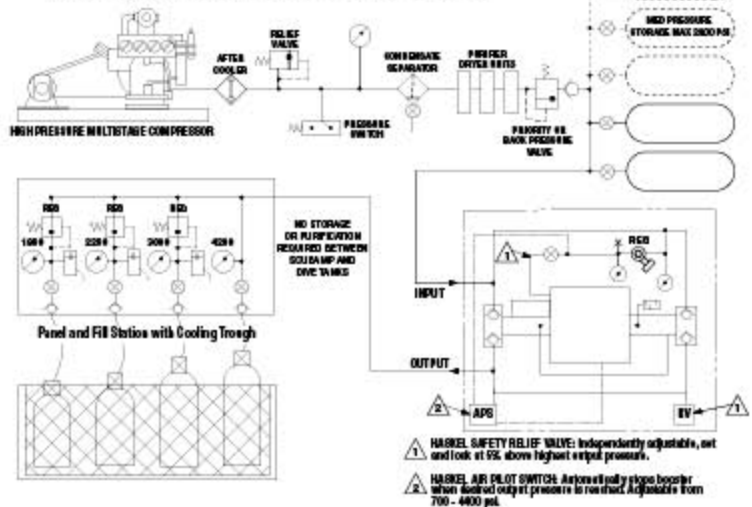
### TYPICAL FILL TIMES

| From Pressure in Storage (After Equalizing in Dive Tank) | To Nominal Tank Size and Pressure |                          |                          |                        |
|--|-----------------------------------|--------------------------|--------------------------|------------------------|
|  | 83 cu. Ft. to 3000 psi            | 71.2 cu. Ft. to 2475 psi | 71.2 cu. Ft. to 2250 psi | 80 cu. Ft. to 4400 psi |
| 2500 psi   | 12 sec.                           |                          |                          | 60 sec.                |
| 2250 psi   | 28 sec.                           | 14 sec.                  |                          | 90 sec.                |
| 2000 psi   | 39 sec.                           | 22 sec.                  | 12 sec.                  |                        |
| 1500 psi   | 75 sec.                           | 50 sec.                  | 35 sec.                  |                        |

Performance based on 100 psi air drive @ 50 SCFM.



### SCHEMATIC OF TYPICAL HIGH PRESSURE AIR INSTALLATION WITH ADDITION OF MODEL 28153 "SCUBAMP" BOOSTER



## Gas Transfer, Test & Charging Carts

Typical gases used are O<sub>2</sub>, N<sub>2</sub>, He, Ar & Air used for transfer, charging, testing, calibration or tool operation.



## Console Controlled Test Systems

Test console housing pneumatic Gas Booster selected to meet test parameters of the customers specification. Gas pressures can be produced up to 39,000 psig.



## Natural Gas Vehicle Fueling Systems

Natural Gas Boosting System with Storage eliminates the need for mechanical compressors where high pressure and low pressure Natural Gas sources are available.



## Gas Cylinder Test Rigs

Hydrostatic and cylinder stretch test rigs for inspection and testing of all gas cylinder and pressure vessels, including oxygen, nitrogen, carbon dioxide and halon bottles.





## Hydraulic Driven Gas Boosters

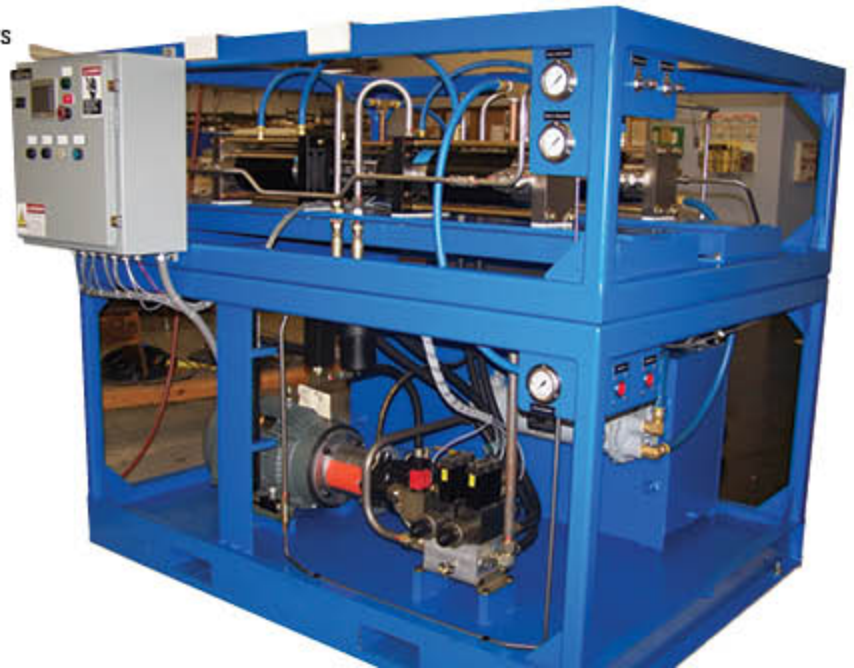
For flow rates that typically go beyond the capability of pneumatic driven boosters.

Haskel's gas booster product line began with hydraulic driven gas boosters. Their gas compression technology has been proven in critical applications such as Fuel Cell / Hydrogen, Photovoltaic, Semiconductor, Specialty Gases, and more.

Capable of boosting a variety of gases, Haskel's broad range of Hydraulic Driven Gas Boosters offer complete flexibility for your gas compression and transfer needs. The key design elements incorporated in this range are based on the Haskel technology that has been combined with cutting edge hydraulic drive control to provide a complete solution, from plug-in electrical supply to reliable gas output pressure and flow.

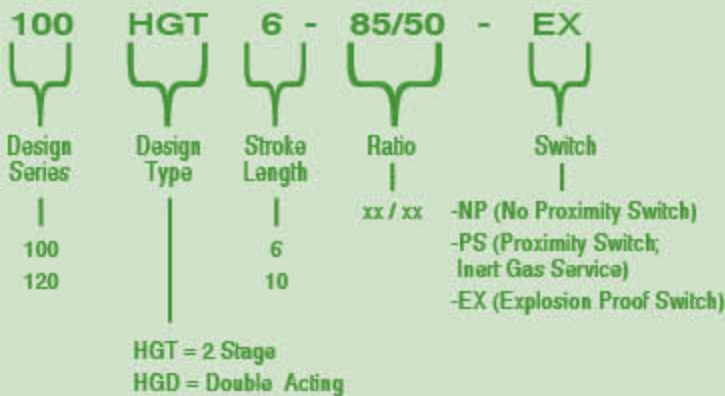
### Applications

- Hydrogen Filling Stations
- Charging high-pressure gas cylinders and receivers
- Gas assisted plastic injection molding
- Hydraulic accumulator charging
- Charging air bag storage vessels
- Missile and satellite launch and guidance systems
- Component testing
- Laser cutting and welding
- Oilfield high volume gas testing
- Automotive hoses and component gas testing
- Hot isostatic pressing
- Inert/specialty gas transfer
- Biogas charging
- Extending pressure
- Gas blanketing





### Hydraulic Driven Gas Booster Model Number Configuration



## Designs

### Single-Stage Double Acting Models

- Available in 7 models with flow rates to **400 scfm** and maximum supply and outlet pressures to **16,000 psig**
- Designed for high flow and low-to medium compression ratios

### Two-Stage Models

- Available in 8 models with flow rates to 45 scfm. Maximum supply pressure 6000 psig. Maximum outlet pressure to 16,000 psig
- Modular construction for easy gas section maintenance
- Adapts to multiple units in parallel or in series driven by one power source

### Optional Features (normally provided by Haskel distributor or system integrator)

- Motor starter
- Remote operator station
- Inlet pressure control loop
- Heater hydraulic reservoir
- Temperature control loop
- Noise attenuating panels
- Water chiller - Cooling loop

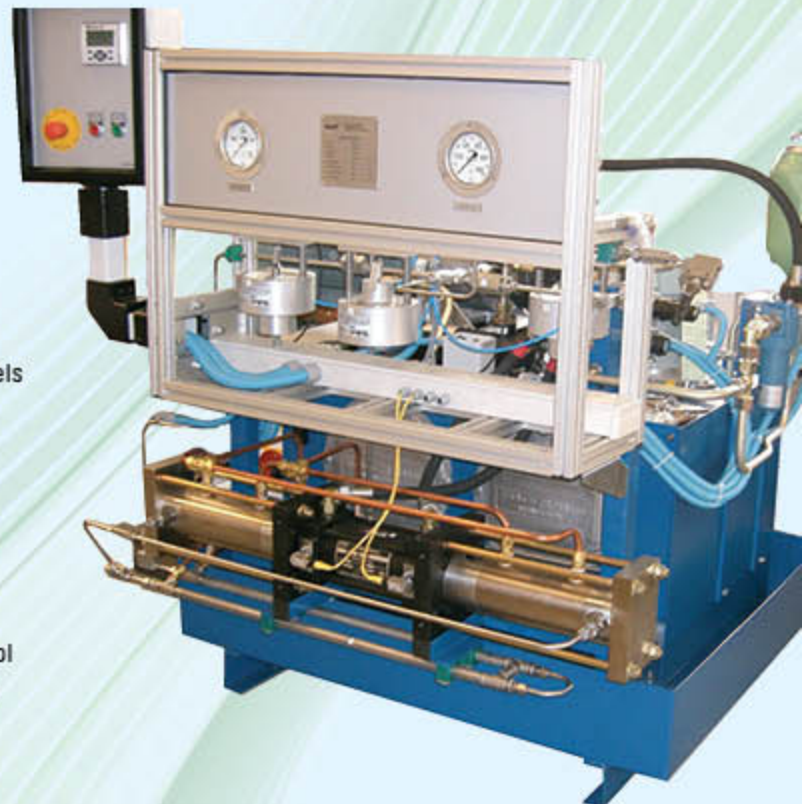
Varying applications require many different booster and horse power (HP) combinations. Haskel can assist with HP and Cooling requirements and provide circuitry assistance on the following issues: PID Control - review and advisement, electrical control, and heat exchanger recommendations. General HPU recommendations and guidelines are available from Haskel drawing 87100-TAB.

## Features

- Stainless Steel/Monel gas barrel construction
- Oil Free, gas section non-lubricated operation
- Integrated cooling barrels on each gas section
- Isolation between hydraulic and gas sections to prevent contamination.
- 6in. and 10in. stroke models
- Proximity switch control to automate cycling
- Able to accept high supply pressures

## Benefits

- Capable of flow rates up to 8 x higher than air driven models
- Modular construction for easy gas section maintenance
- Will not rust like other carbon steel manufactured units
- Non-contaminating gas compression
- Minimizes gas temperature rise from compression
- Suitable for ultra pure gas compression
- Broad range of flows and pressures
- Smooth stroke direction changeover and cycle rate control
- Multiple gas boosters can be driven by one power source
- Steady state cycle control to maximize seal life
- High efficiency for continuous operation



**LEGEND**

HP = Horsepower Input based on Max. Hyd. Pressure 2500 psig

Ps = Gas Supply Pressure (PSI)

Po = Gas Outlet Pressure (PSI)

CPM = Cycles Per Min. (18 max 120 series, 25 max. 100 series)

Q = Gas Outlet Flow Rate (SCFM)

| Part Number     | Hydraulic Driven Gas Booster Specifications |     |                         |     |                         |     |                           |                    |             |                   | Sample Performance            |      |       |     |       |
|-----------------|---|-----|-------------------------|-----|-------------------------|-----|---------------------------|--------------------|-------------|-------------------|-------------------------------|------|-------|-----|-------|
|                 | Supply Pressure Minimum                     |     | Supply Pressure Maximum |     | Outlet Pressure Maximum |     | Maximum Compression Ratio | Displacement Cycle |             | Cycles Per Minute | Hydraulic Pressure : 2500 PSI |      |       |     |       |
|                 | PSIG  | BAR | PSIG                    | BAR | PSIG                    | BAR |                           | Cubic Inches       | Milliliters |                   | HP Input                      | Ps   | Po    | CPM | Q     |
| 100HGD6-145     | 50  | 3.5 | 1850                    | 127 | 1850                    | 127 | 6                         | 312                | 5106        | 25                | 22.4                          | 150  | 900   | 25  | 39.0  |
|                 |   |     |                         |     |                         |     |                           |                    |             |                   | 27.0                          | 250  | 1200  | 25  | 64.5  |
|                 |   |     |                         |     |                         |     |                           |                    |             |                   | 28.2                          | 500  | 1500  | 25  | 131.2 |
|                 |   |     |                         |     |                         |     |                           |                    |             |                   | 27.2                          | 1050 | 2000  | 25  | 280   |
| 100HGD6-115     | 50  | 3.5 | 2750                    | 189 | 2750                    | 189 | 6                         | 191                | 3128        | 25                | 22.0                          | 200  | 1400  | 25  | 30.5  |
|                 |   |     |                         |     |                         |     |                           |                    |             |                   | 26.6                          | 275  | 1800  | 25  | 41.7  |
|                 |   |     |                         |     |                         |     |                           |                    |             |                   | 27.3                          | 725  | 2300  | 25  | 115   |
|                 |   |     |                         |     |                         |     |                           |                    |             |                   | 27.7                          | 1200 | 2800  | 25  | 193   |
| 100HGD6-85      | 100   | 7   | 6000                    | 413 | 6500                    | 448 | 6                         | 107                | 1760        | 25                | 16.9                          | 500  | 2000  | 25  | 44.1  |
|                 |   |     |                         |     |                         |     |                           |                    |             |                   | 27.4                          | 690  | 3500  | 25  | 59.0  |
|                 |   |     |                         |     |                         |     |                           |                    |             |                   | 28.5                          | 1800 | 4750  | 25  | 159   |
|                 |   |     |                         |     |                         |     |                           |                    |             |                   | 27.2                          | 3200 | 6000  | 25  | 272   |
| 100HGD6-50      | 100   | 7   | 9000                    | 620 | 13500                   | 930 | 6                         | 40                 | 657         | 25                | 19.3                          | 1200 | 6000  | 25  | 37.4  |
|                 |   |     |                         |     |                         |     |                           |                    |             |                   | 24.0                          | 1600 | 8000  | 25  | 49.4  |
|                 |   |     |                         |     |                         |     |                           |                    |             |                   | 27.2                          | 2500 | 10000 | 25  | 78.3  |
|                 |   |     |                         |     |                         |     |                           |                    |             |                   | 27.2                          | 4500 | 12000 | 25  | 129   |
| 120HGD10-165    | 50  | 3.5 | 1850                    | 127 | 1850                    | 127 | 6                         | 716                | 11728       | 18                | 25.1                          | 75   | 550   | 18  | 36.0  |
|                 |   |     |                         |     |                         |     |                           |                    |             |                   | 43.4                          | 175  | 1100  | 18  | 77.7  |
|                 |   |     |                         |     |                         |     |                           |                    |             |                   | 44.4                          | 250  | 1200  | 18  | 111   |
|                 |   |     |                         |     |                         |     |                           |                    |             |                   | 42.4                          | 300  | 1200  | 18  | 133   |
| 120HGD10-85     | 100   | 7   | 6000                    | 413 | 6500                    | 448 | 6                         | 179                | 2931        | 18                | 24.2                          | 800  | 2500  | 18  | 87.6  |
|                 |   |     |                         |     |                         |     |                           |                    |             |                   | 27.0                          | 1200 | 3200  | 18  | 131   |
|                 |   |     |                         |     |                         |     |                           |                    |             |                   | 40.4                          | 1300 | 4600  | 18  | 129   |
|                 |   |     |                         |     |                         |     |                           |                    |             |                   | 39.5                          | 2500 | 5800  | 18  | 265   |
| 120HGD10-50     | 100   | 7   | 9000                    | 620 | 13500                   | 930 | 6                         | 68                 | 1111        | 18                | 29.6                          | 1400 | 7000  | 18  | 55.3  |
|                 |   |     |                         |     |                         |     |                           |                    |             |                   | 35.4                          | 1800 | 9000  | 18  | 70.5  |
|                 |   |     |                         |     |                         |     |                           |                    |             |                   | 41.2                          | 2200 | 11000 | 18  | 85.4  |
|                 |   |     |                         |     |                         |     |                           |                    |             |                   | 48.0                          | 2800 | 13500 | 18  | 107   |
| 100HGT6-145/85  | 50  | 3.5 | 1850                    | 127 | 6500                    | 448 | 104                       | 156                | 2556        | 25                | 16.8                          | 250  | 2200  | 25  | 33.6  |
|                 |   |     |                         |     |                         |     |                           |                    |             |                   | 20.4                          | 300  | 2800  | 25  | 40.0  |
|                 |   |     |                         |     |                         |     |                           |                    |             |                   | 23.7                          | 400  | 3500  | 25  | 52.8  |
|                 |   |     |                         |     |                         |     |                           |                    |             |                   | 27.3                          | 500  | 4000  | 25  | 65.7  |
| 100HGT6-145/50  | 50  | 3.5 | 1850                    | 127 | 6500                    | 448 | 280                       | 156                | 2556        | 25                | 27.1                          | 150  | 3200  | 25  | 18.9  |
|                 |   |     |                         |     |                         |     |                           |                    |             |                   | 28.0                          | 150  | 3800  | 25  | 18.9  |
|                 |   |     |                         |     |                         |     |                           |                    |             |                   | 28.4                          | 150  | 4950  | 25  | 18.8  |
|                 |   |     |                         |     |                         |     |                           |                    |             |                   | 28.6                          | 150  | 5500  | 25  | 18.8  |
| 100HGT6-115/85  | 50  | 3.5 | 2750                    | 189 | 6500                    | 448 | 64                        | 95                 | 1556        | 25                | 19.0                          | 250  | 2200  | 25  | 21.1  |
|                 |   |     |                         |     |                         |     |                           |                    |             |                   | 23.1                          | 300  | 2800  | 25  | 25.1  |
|                 |   |     |                         |     |                         |     |                           |                    |             |                   | 25.7                          | 400  | 3500  | 25  | 33.2  |
|                 |   |     |                         |     |                         |     |                           |                    |             |                   | 29.8                          | 500  | 4000  | 25  | 41.3  |
| 100HGT6-115/50  | 50  | 3.5 | 2750                    | 189 | 13500                   | 930 | 171                       | 95                 | 1556        | 25                | 14.6                          | 175  | 3500  | 25  | 14.1  |
|                 |   |     |                         |     |                         |     |                           |                    |             |                   | 14.7                          | 175  | 4000  | 25  | 14.1  |
|                 |   |     |                         |     |                         |     |                           |                    |             |                   | 17.4                          | 175  | 5000  | 25  | 14.0  |
|                 |   |     |                         |     |                         |     |                           |                    |             |                   | 20.8                          | 250  | 6000  | 25  | 11.5  |
| 100HGT6-85/50   | 100   | 7   | 6000                    | 413 | 13500                   | 930 | 96                        | 53                 | 868         | 25                | 17.5                          | 300  | 5000  | 25  | 13.8  |
|                 |   |     |                         |     |                         |     |                           |                    |             |                   | 22.6                          | 400  | 7000  | 25  | 31.0  |
|                 |   |     |                         |     |                         |     |                           |                    |             |                   | 24.8                          | 500  | 8000  | 25  | 22.6  |
|                 |   |     |                         |     |                         |     |                           |                    |             |                   | 28.7                          | 750  | 10000 | 25  | 33.7  |
| 120HGT10-165/85 | 50  | 3.5 | 1850                    | 127 | 6500                    | 448 | 144                       | 358                | 5866        | 18                | 28.8                          | 175  | 2800  | 18  | 39.8  |
|                 |   |     |                         |     |                         |     |                           |                    |             |                   | 33.8                          | 200  | 3500  | 18  | 45.2  |
|                 |   |     |                         |     |                         |     |                           |                    |             |                   | 43.4                          | 200  | 4500  | 18  | 45.1  |
|                 |   |     |                         |     |                         |     |                           |                    |             |                   | 46.3                          | 250  | 5000  | 18  | 55.8  |
| 120HGT10-165/50 | 50  | 3.5 | 1850                    | 127 | 13500                   | 930 | 386                       | 90                 | 1474        | 18                | 47.2                          | 100  | 4000  | 18  | 22.2  |
|                 |   |     |                         |     |                         |     |                           |                    |             |                   | 47.1                          | 100  | 5000  | 18  | 22.1  |
|                 |   |     |                         |     |                         |     |                           |                    |             |                   | 51.8                          | 110  | 7000  | 18  | 24.1  |
|                 |   |     |                         |     |                         |     |                           |                    |             |                   | 52.2                          | 110  | 8000  | 18  | 24.6  |
| 120HGT10-85/50  | 100   | 7   | 6000                    | 413 | 13500                   | 930 | 96                        | 34                 | 557         | 18                | 31.4                          | 300  | 7000  | 18  | 16.9  |
|                 |   |     |                         |     |                         |     |                           |                    |             |                   | 32.4                          | 600  | 8000  | 18  | 33.2  |
|                 |   |     |                         |     |                         |     |                           |                    |             |                   | 38.3                          | 700  | 10000 | 18  | 38.6  |
|                 |   |     |                         |     |                         |     |                           |                    |             |                   | 48.4                          | 900  | 13500 | 18  | 49.4  |

# Applications for Pneumatic and Hydraulic Driven Gas Boosters and Gas Booster Systems

## General Applications

- Condenser Leak Detection
- Gas Transfer Circuit Breakers
- Aircraft Jacking
- Helicopter Pop Floats
- Autoclaving - Low Pressure
- Hot Isostatic Presses
- Automotive Air Bag Vessel Filling
- Helium Leak Pressure Testing
- Blow Molding
- Boost Pressures from N2/O2 Generators
- Breathing Air Systems
- Laser Cutting (Ar, N2,O2, He)
- CFC Recovery
- Leak Detection Systems
- Charging Gas Suspensions
- Missile Test Systems
- Cooling with Helium in Pilot Plants
- Nitrogen Injection for Molding Machines
- Cryostat Testing (Nitrogen and Argon)
- Nitrogen Accumulator Charging
- Die Cushion Cylinder Charging
- Oxygen Life Support Bottles
- Escape Chute Charging – Co2 Charging
- Oxygen Boosting
- Fuel Cells; Mobile, Portable and Stationary
- Power Valve Actuation/Hold Dump Valves Closed
- Gas Assisted Injection Molding (GAIN)
- Gas Charging for Aircraft Tire Inflation
- Pressure Testing of Hydraulic Systems – Skydrol
- Gas Pressure and Leak Testing
- Super Critical Fluid Extraction
- Gas Reclaim - Low Pressure
- Testing Brake Calipers
- Cylinder Hydro Test

## Hydrogen Applications

Haskel Manufactures the most extensive range of gas handling solutions for gas transfer or boosting applications, including **Hydrogen**. **Hydrogen** use products include Pneumatic or Hydraulic Driven Gas Boosters, Diaphragm Compressors, and BuTech High Pressure Valves and Fittings, that are Hydrogen rated to over 20,000 psig.

- Hydrogen Infrastructure
- Hydrogen Fueling & Filling Stations
- Hydrogen Compression, Storage & Transfer
- Fuel cell: Mobile, Portable & Stationary
- Boosting H2 Generator Outlet Pressure
- Hydrogen Purification
- Hydrogen Generation
- Hydrogenation
- PTA manufacture
- Polysilicon manufacture
- Petroleum recovery and refining
- Hydrogenation reactions
- Cylinder filling for storage from H2 generation
- R&D lab gas distribution
- Power generation (used as a coolant)
- Semiconductor manufacturing



## Pneumatic Driven Gas Boosters for Hydrogen Applications

| Booster Model | Supply Pressure | Flow SCFM @ psi* | Pressure Limit (psi) | Hydrogen System Model # |
|---------------|-----------------|------------------|----------------------|-------------------------|
| AG-62         | 1000            | 4.21 @ 4800      | 9,000                | 86979                   |
| AG-75         | 1500            | 3.81 @ 6000      | 12,000               | 86980                   |
| AG-152        | 2000            | 3.02 @ 12000     | 15,000               | 86981                   |
| AGD-7         | 150             | 6.85 @ 710       | 2,500                | 86982                   |
| AGD-15        | 500             | 10.68 @ 1700     | 4,000                | 86983                   |
| AGD-30        | 750             | 8.12 @ 3150      | 9,000                | 86984                   |
| AGD-32        | 750             | 10.75 @ 3150     | 4,000                | 86985                   |
| AGD-62        | 1000            | 6.97 @ 5800      | 9,000                | 86986                   |
| AGD-75        | 1500            | 6.18 @ 7500      | 12,000               | 86987                   |
| AGD-152       | 2000            | 5.07 @ 14000     | 15,000               | 86988                   |
| AGT-7/15      | 100             | 2.63 @ 1410      | 2,500/4,000          | 86989                   |
| AGT-7/30      | 100             | 2.30 @ 2820      | 2,500/9,000          | 86990                   |
| AGT-14/62     | 250             | 5.8 @ 4000       | 2,500/9,000          | 86991                   |
| AGT-15/30     | 500             | 5.88 @ 3400      | 4,000/9,000          | 86992                   |
| AGT-15/75     | 250             | 2.34 @ 7250      | 4,000/12,000         | 86993                   |
| AGT-30/75     | 500             | 2.70 @ 7250      | 9,000/12,000         | 86994                   |
| AGT-32/62     | 1000            | 8.08 @ 6800      | 4,000/9,000          | 86995                   |
| AGT-32/152    | 350             | 1.93 @ 13750     | 4,000/15,000         | 86996                   |
| AGT-62/152    | 1000            | 3.80 @ 14500     | 9,000/15,000         | 86997                   |

Based on 100 psi Drive Pressure and 48 SCFM (Pa=100, Qa=48)

| Booster Model | Supply Pressure | Flow SCFM @ psi* | Pressure Limit (psi) | Hydrogen System Model # |
|---------------|-----------------|------------------|----------------------|-------------------------|
| 8AGD-14       | 150             | 9.20 @ 980       | 5,000                | 87219                   |
| 8AGD-30       | 750             | 14.26 @ 3150     | 5,000                | 87201                   |
| 8AGD-60       | 1000            | 9.47 @ 5800      | 9,000                | 87185                   |
| 8AGT-14/30    | 500             | 10.73 @ 3400     | 5,000                | 87226                   |
| 8AGT-14/60    | 250             | 3.87 @ 6000      | 9,000                | 87225                   |
| 8AGT-30/60    | 1000            | 10.4 @ 6800      | 9,000                | 87224                   |

Based on 100 psi Drive Pressure and 95 SCFM (Pa=100, Qa=95)

## Selecting Your Accessories

Haskel can either provide accessories separately or supply them fitted to form a complete package suited to your application. Additionally, Haskel can fit customer nominated accessories. Our accessories catalog is available and our technical support team is always ready to advise you on the most suitable choice of accessories for your application.

A full range of high-pressure regulators, valves, switches and ancillary equipment is available to suit all our gas boosters.

- Air pilot switches
  - Air pilot valves
  - Regulating relief valves
  - Directional control and release valves
  - Hydraulic accumulators, gas receivers and storage cylinders
  - High pressure valves, fittings and tubing
  - Plenum chambers
  - Port adapters
  - Pressure Regulators
  - Gauge snubbers
  - Filters
  - Stainless steel check valves
  - Intensifiers with integral checks for cycling
  - Capillary type gauge snubbers
- Please ask for your copy of our latest accessories brochure.



### Regulating Relief and Back Pressure Control Valves

Provide over pressure protection on any high pressure low flow gas or liquid system. (See system accessory catalog.)



### Air Pilot Switches

These pressure switches produce a pneumatic signal up to 150 psi at any sensing pressure within their adjustment range.



### Gas Receivers

Gas receivers in 10,000 and 20,000 psi series. Eleven models from 20 to 897 cu. in. displacements. (See system accessory catalog.)



### Filters

- 5 Microns
- 6000 psi, 30,000 psi 2 models 1/4" NPT and 1/4" S.P. tube
- S.S. or paper elements



### Stainless Steel Check Valves

- Constructed throughout of 316 series stainless steel for high corrosion resistance.
- A PTFE semi soft seat for higher contamination tolerance without leakage. The PTFE initially deflects a slight amount then the ball or poppet to come to rest against the metal seat so the PTFE does not have to absorb the full load of the high pressure.



### Directional Control and Release Valves

Directional Control valves are basically a family with common characteristics and benefits. They are seated poppet or ball design for virtually zero leakage at high pressures with low viscosity fluids.



### Intensifiers

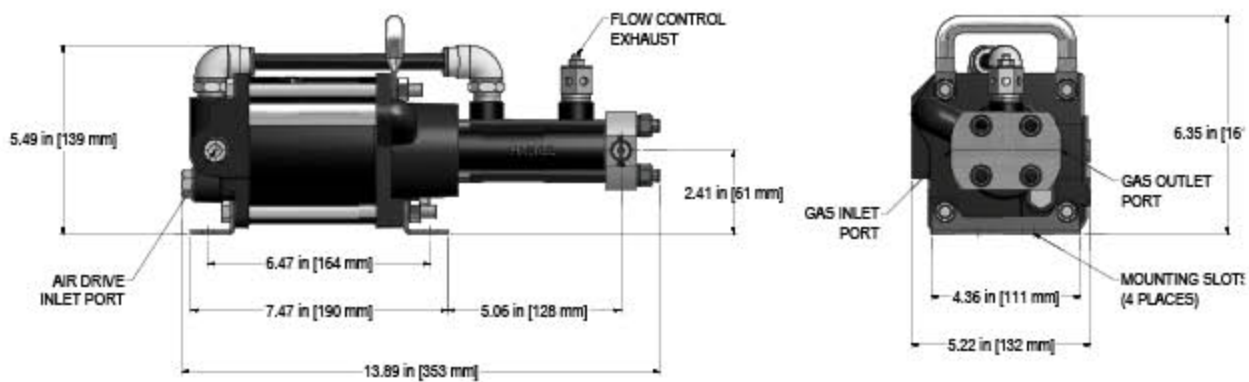
Intensifiers with integral checks for cycling. All stainless steel in high pressure wetted section.



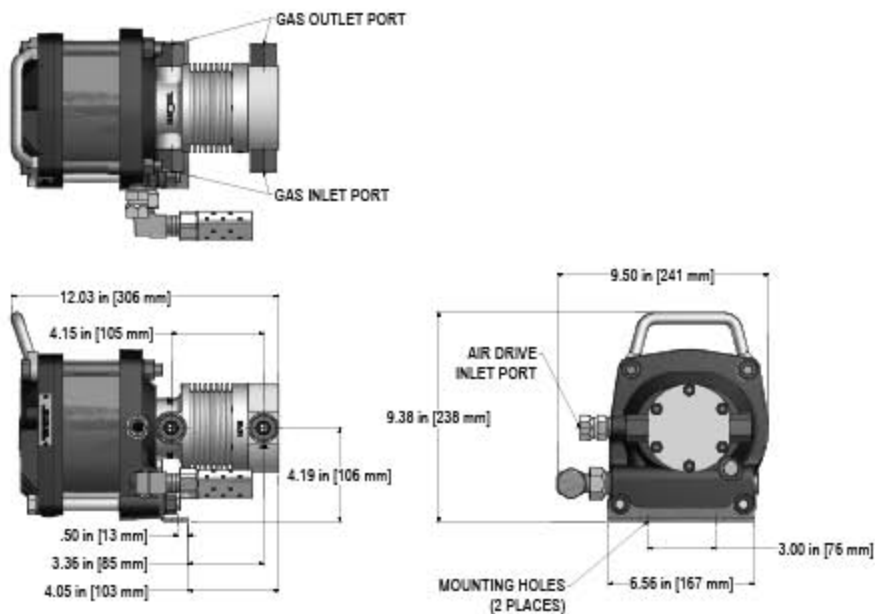
# Pneumatic Driven Gas Booster Dimensional Drawings

Air Drive Inlet Port = 1/2" FNPT all the Models

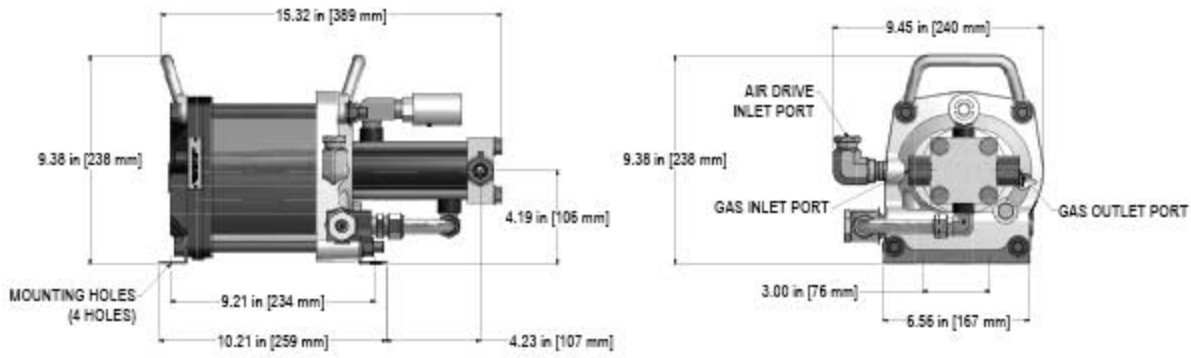
## Gas Booster Model: 4AG-25



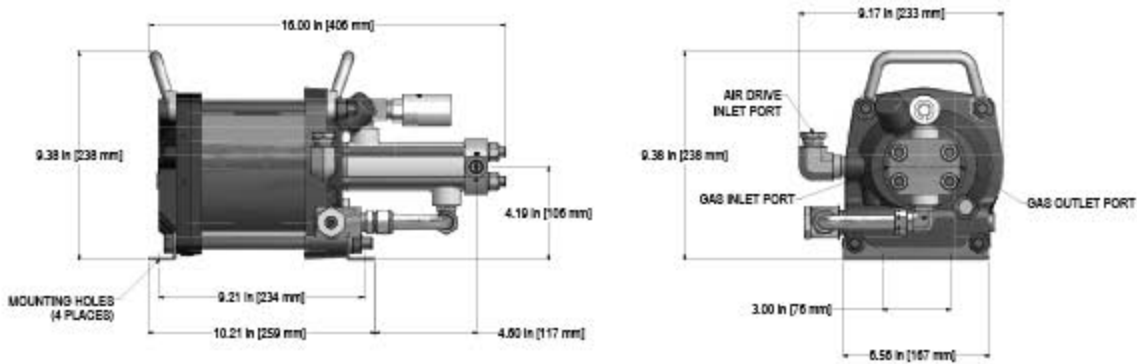
## Gas Booster Model: AG-4



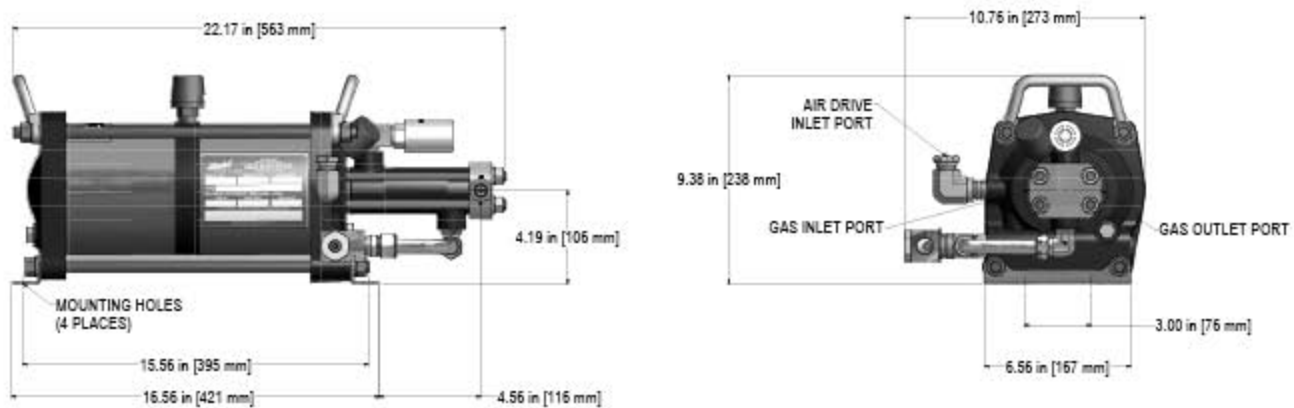
## Gas Booster Model: AG-7



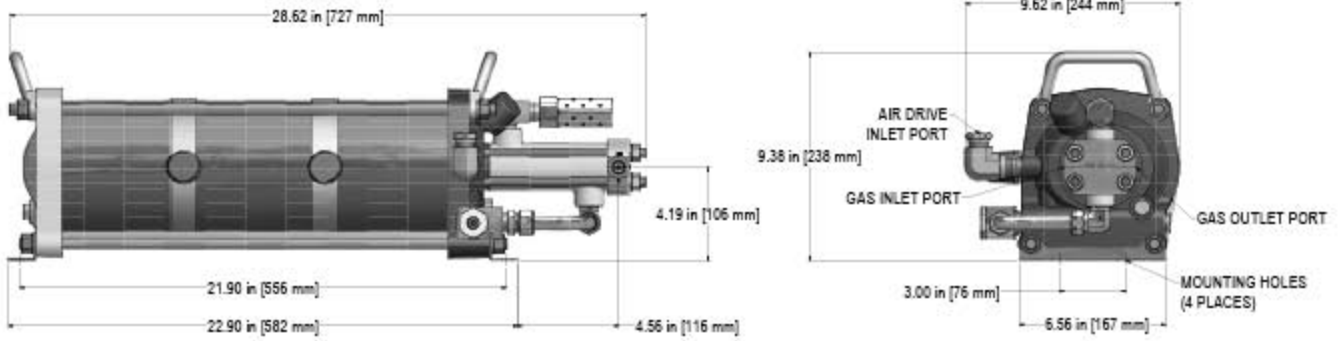
## Gas Booster Models: AG-15, AG-30, AG-50, AG-75



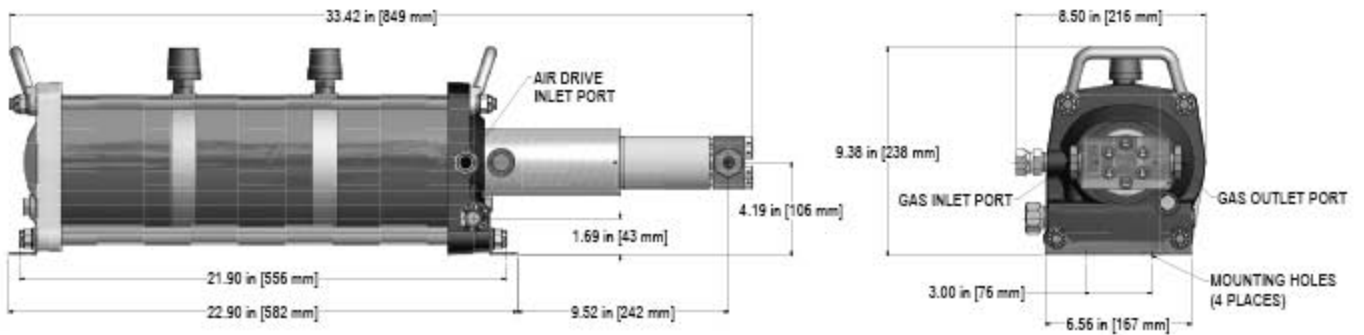
## Gas Booster Models: AG-62, AG-102, AG-152



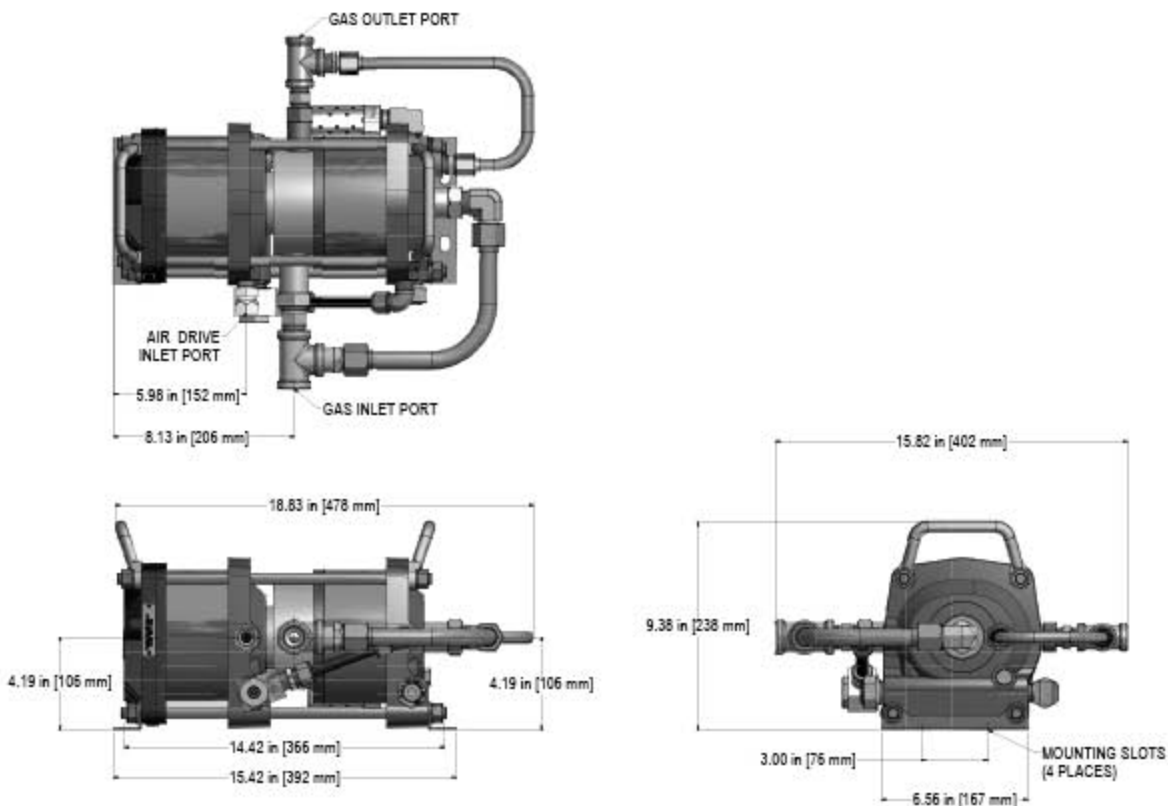
## Gas Booster Models: AG-233



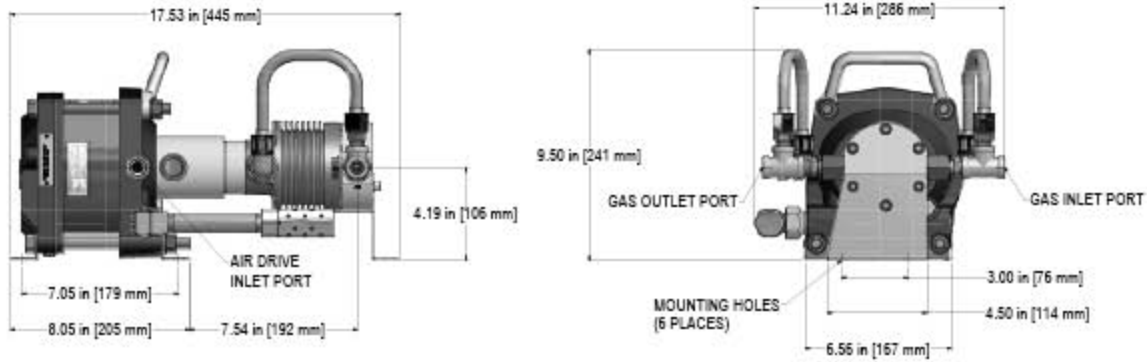
## Gas Booster Models: AG-303



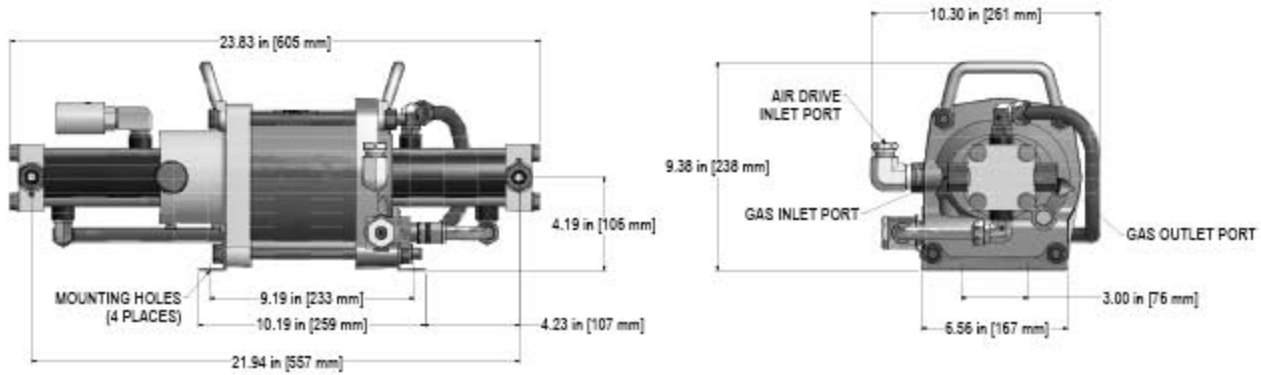
## Gas Booster Models: AGD-1.5



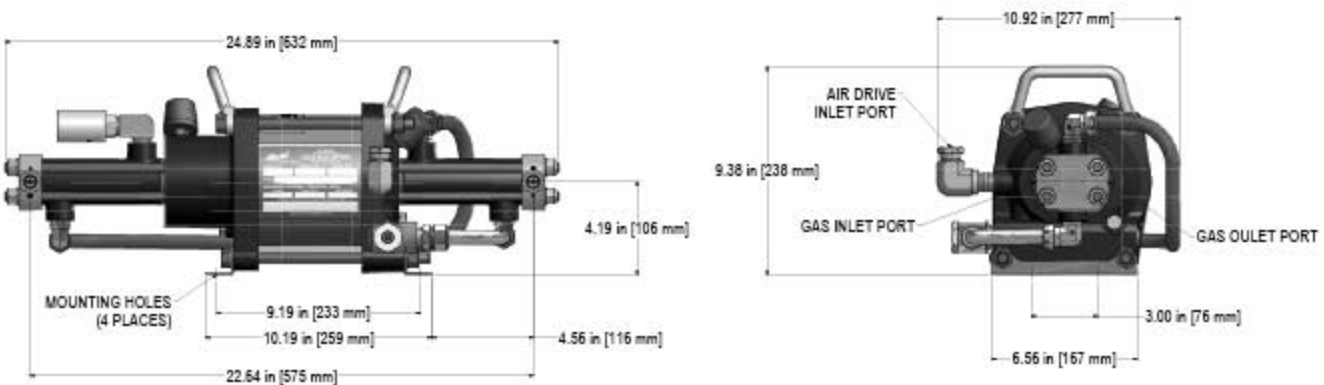
## Gas Booster Models: AGD-4



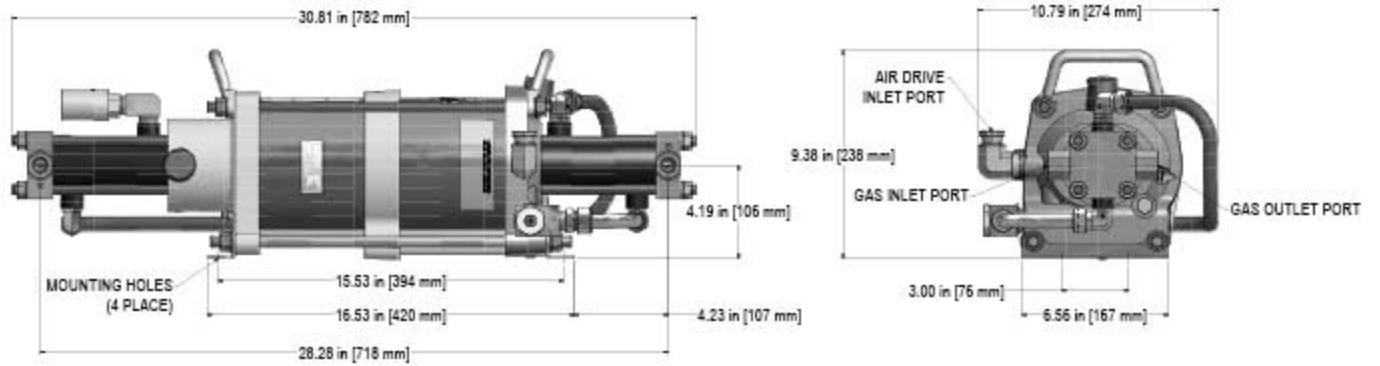
## Gas Booster Models: AGD-7



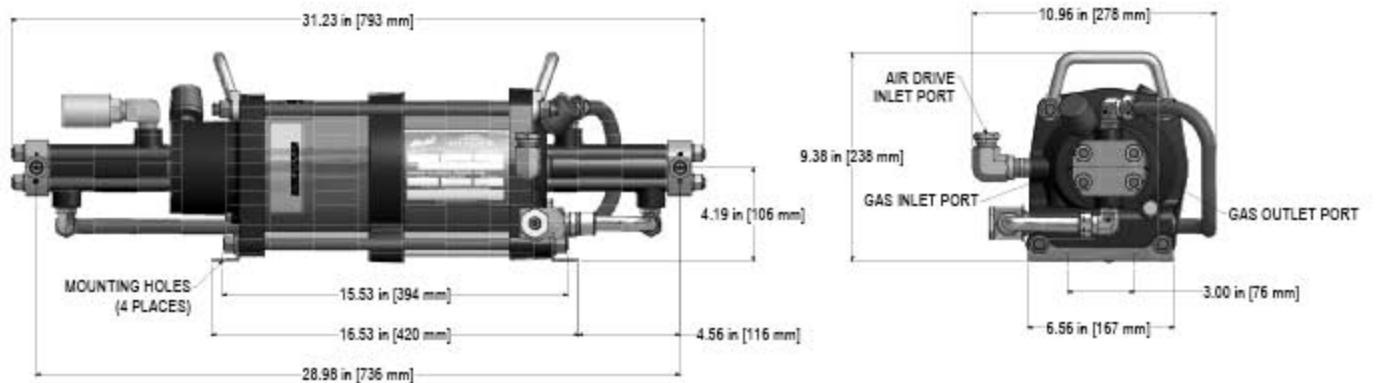
## Gas Booster Models: AGD-15, AGD-30, AGD-50, AGD-75



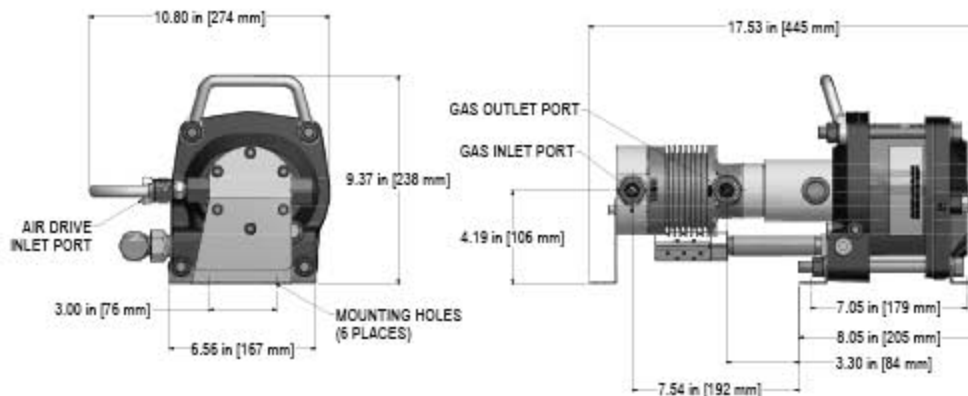
## Gas Booster Models: AGD-14



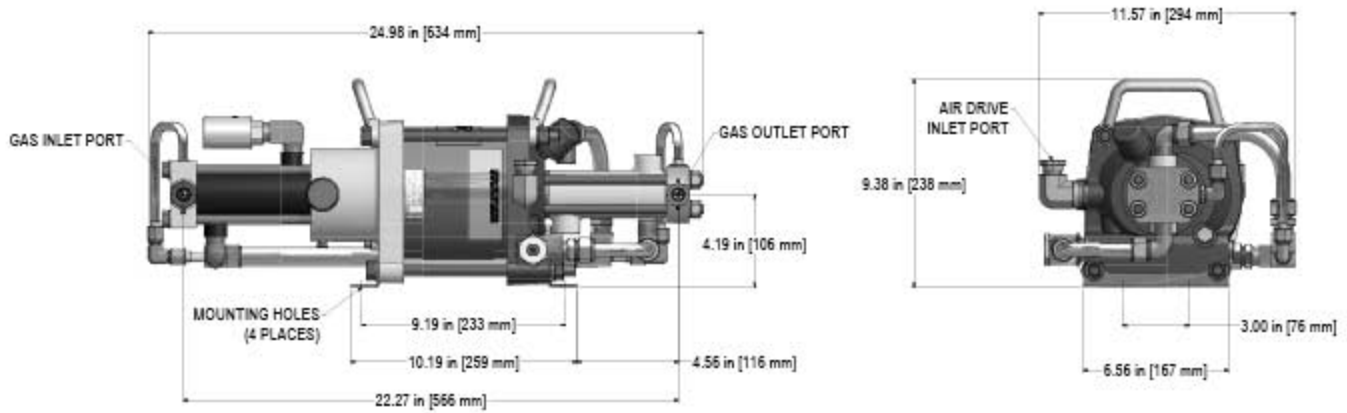
## Gas Booster Models: AGD-32, AGD-62, AGD-102, AGD-152



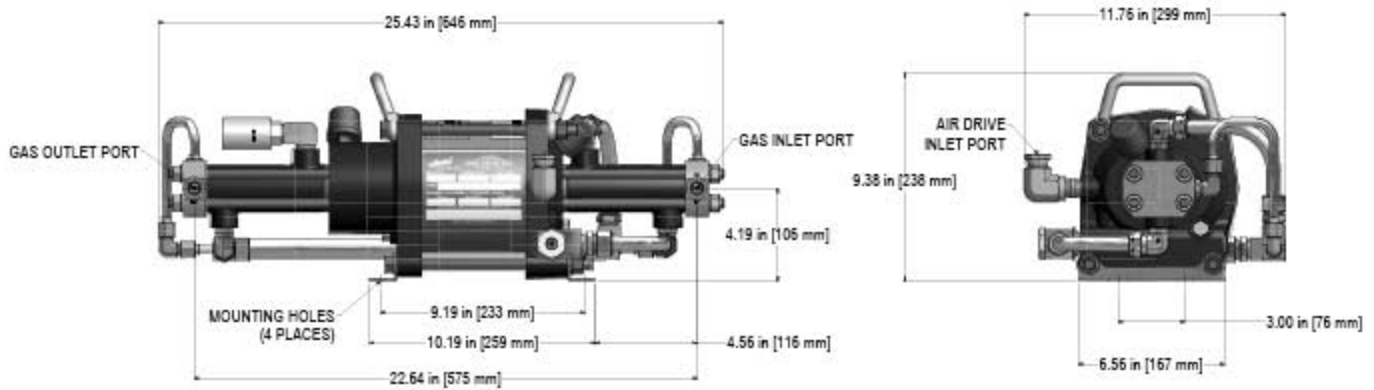
## Gas Booster Models: AGT-4



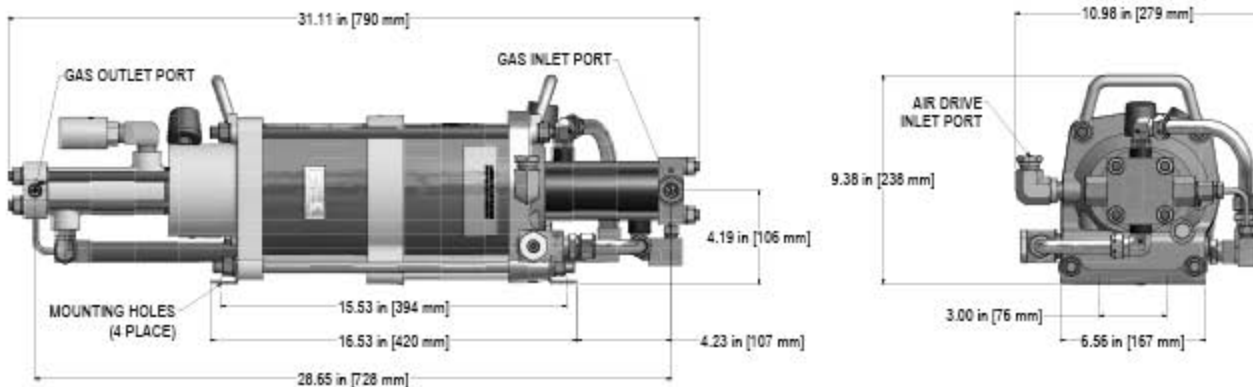
## Gas Booster Models: AGT-7/15, AGT-7/30



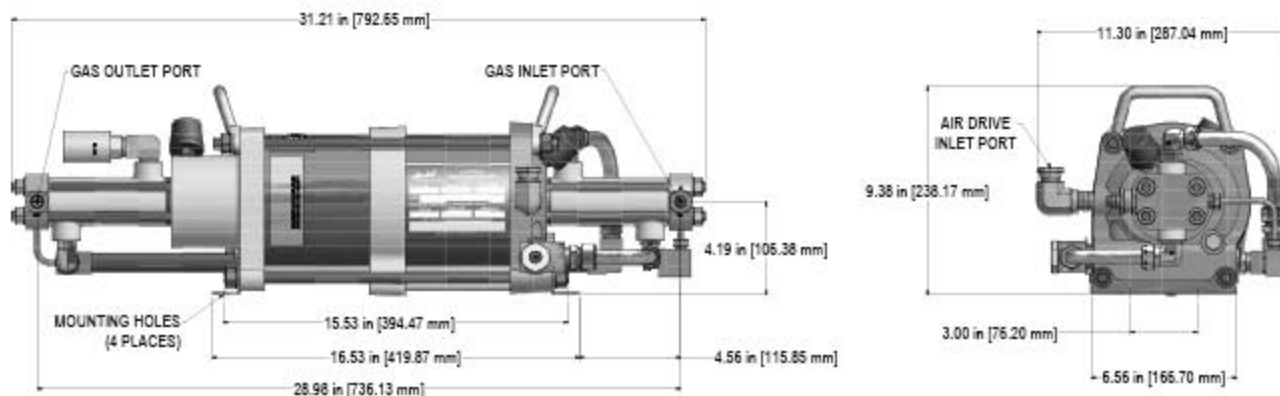
## Gas Booster Models: AGT-15/30, AGT-15/50, AGT-15/75, AGT-30/50, AGT-30/75



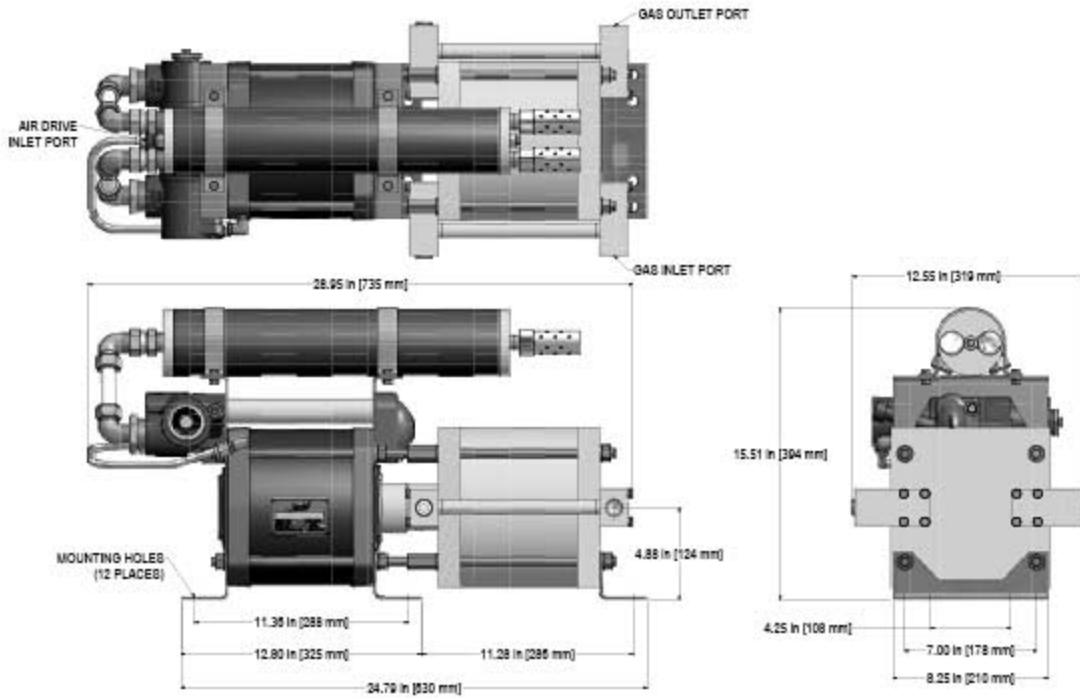
## Gas Booster Models: AGT-14/32, AGT-14/62



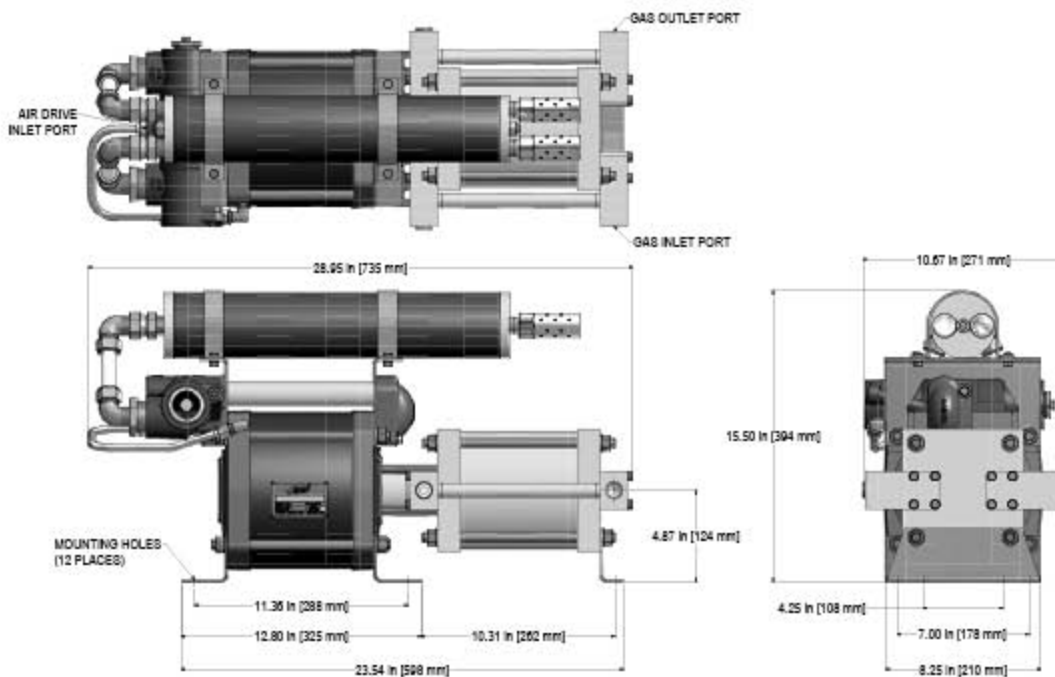
# Gas Booster Models: AGT-32/62, AGT-32/102, AGT-32/152 AGT-62/102, AGT-62/152, AGT-62/152H



## Gas Booster Model: 8AGD-1

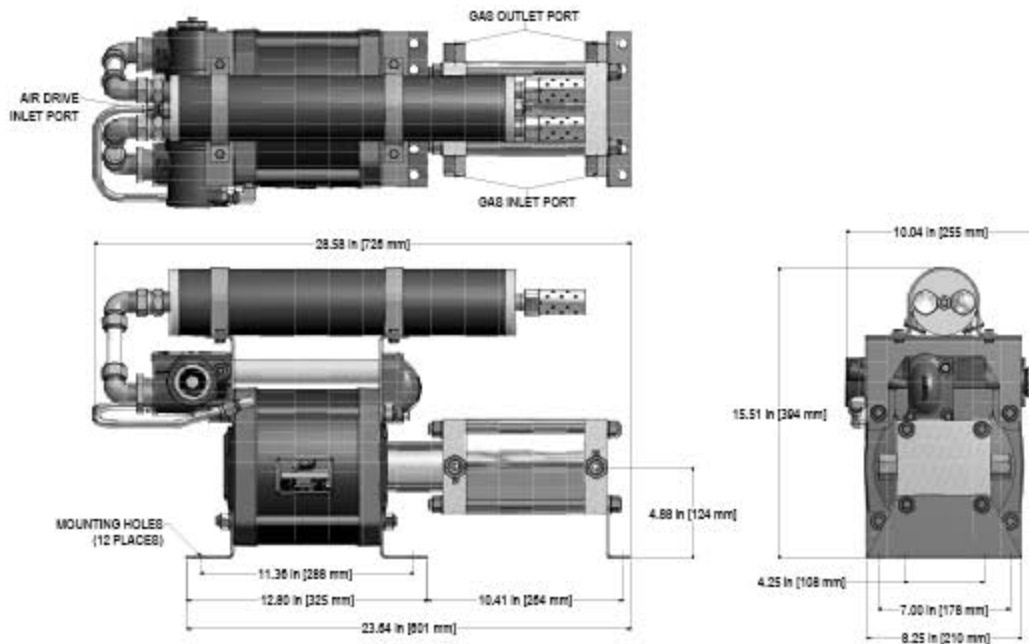


## Gas Booster Model: 8AGD-2

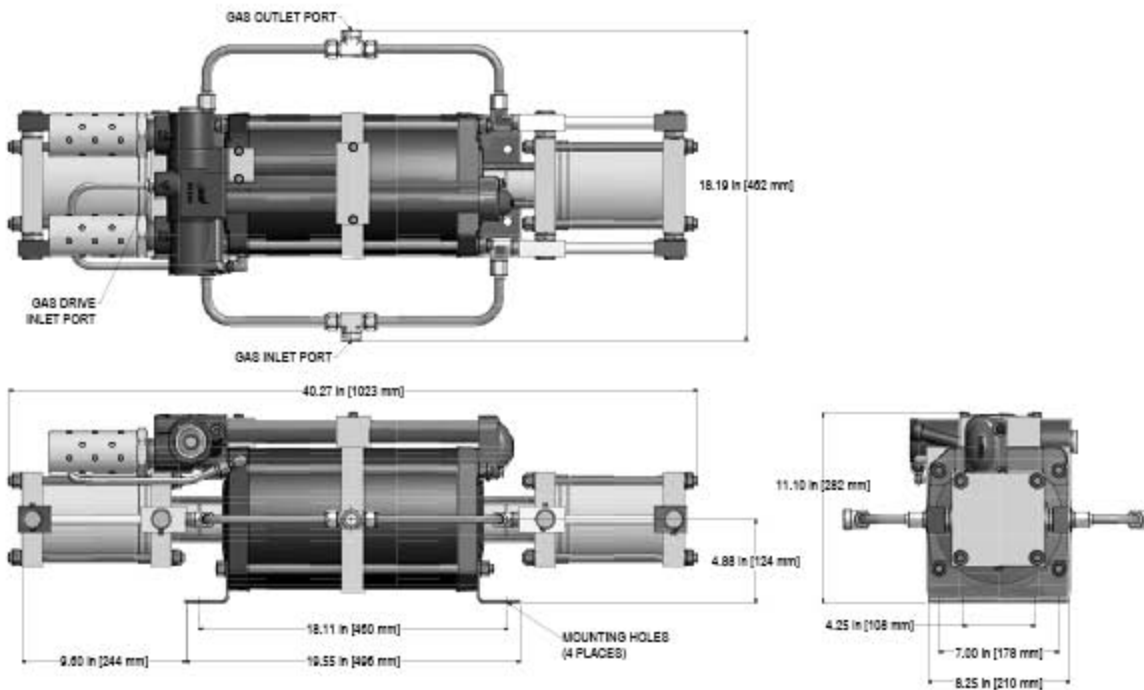




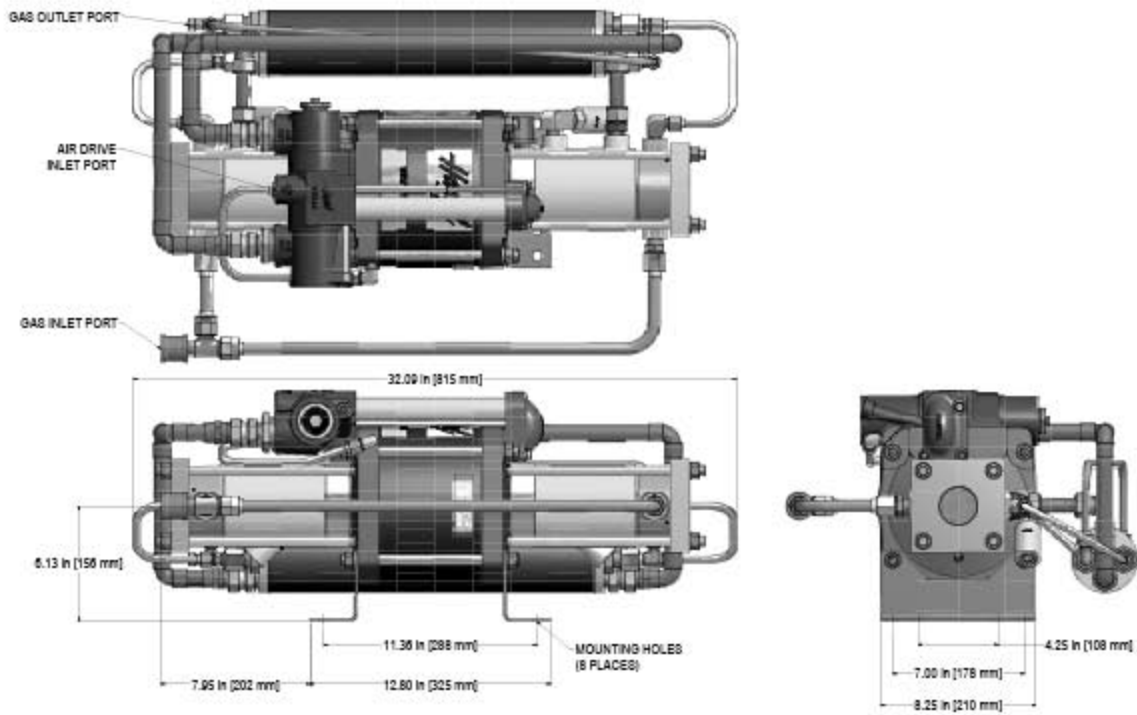
## Gas Booster Models: 8AGD-2.8, 8AGD-2.8H



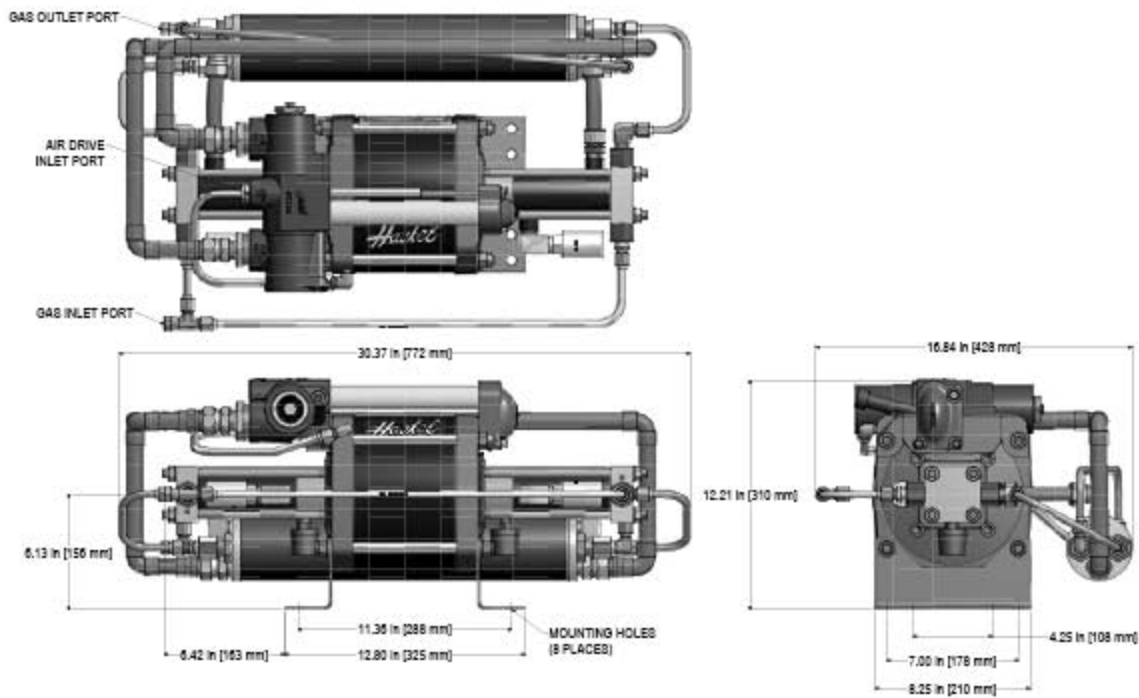
## Gas Booster Model: 8AGD2-2.8



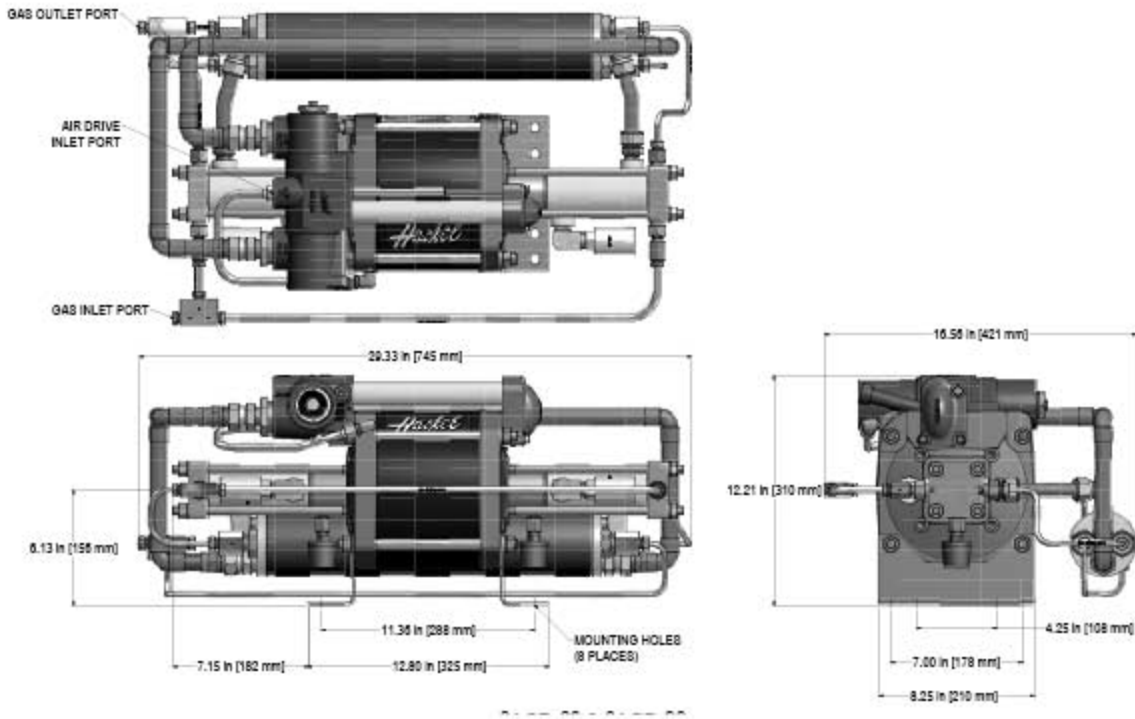
## Gas Booster Model: 8AGD-5



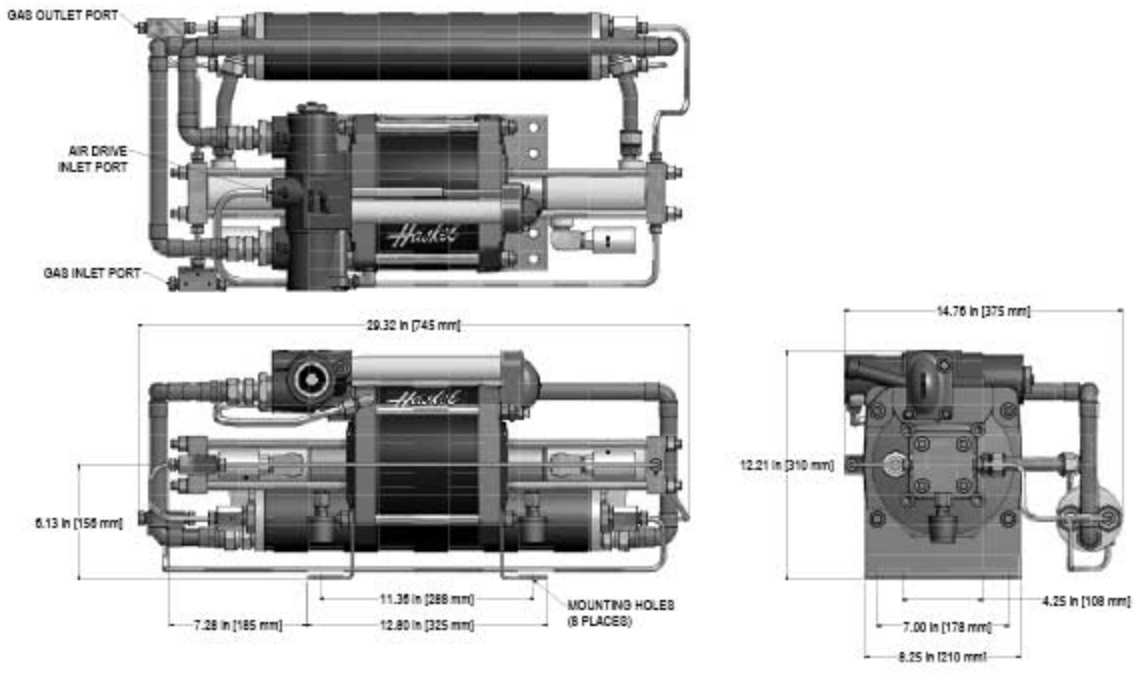
## Gas Booster Model: 8AGD-14



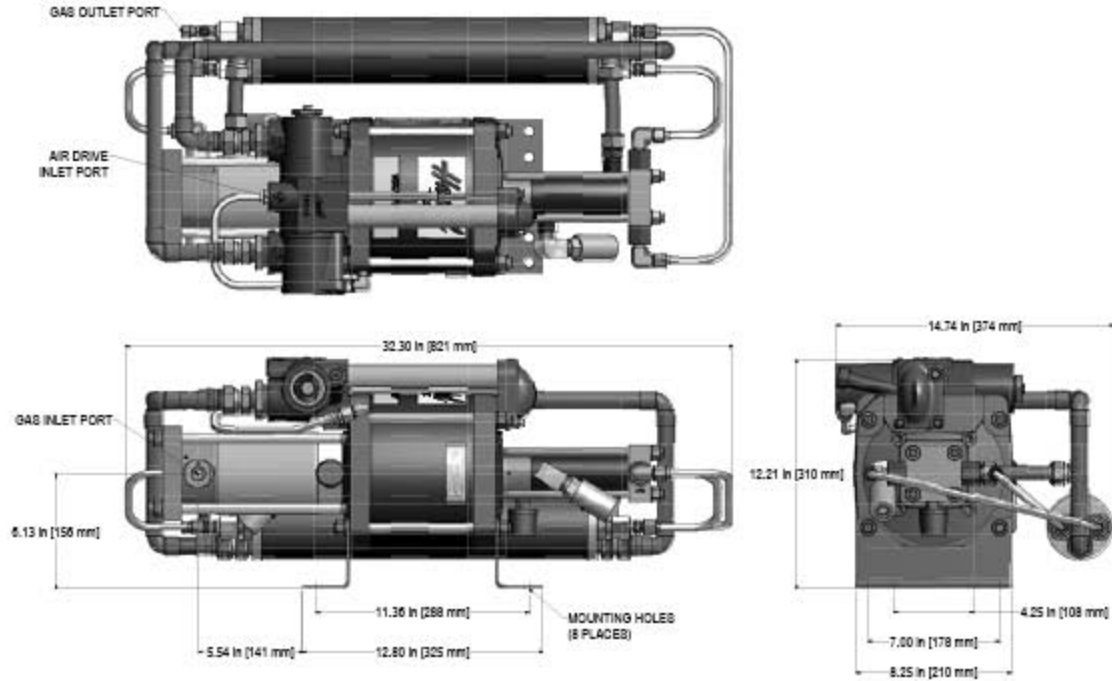
## Gas Booster Models: 8AGD-30, 8AGD-60



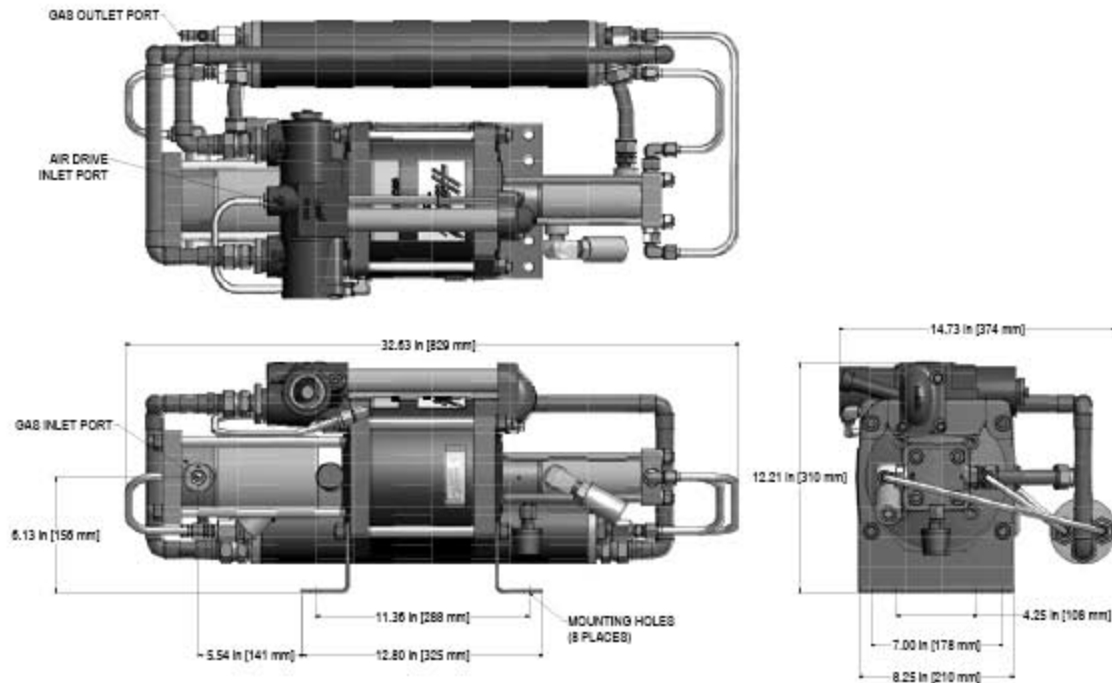
## Gas Booster Model: 8AGD-150



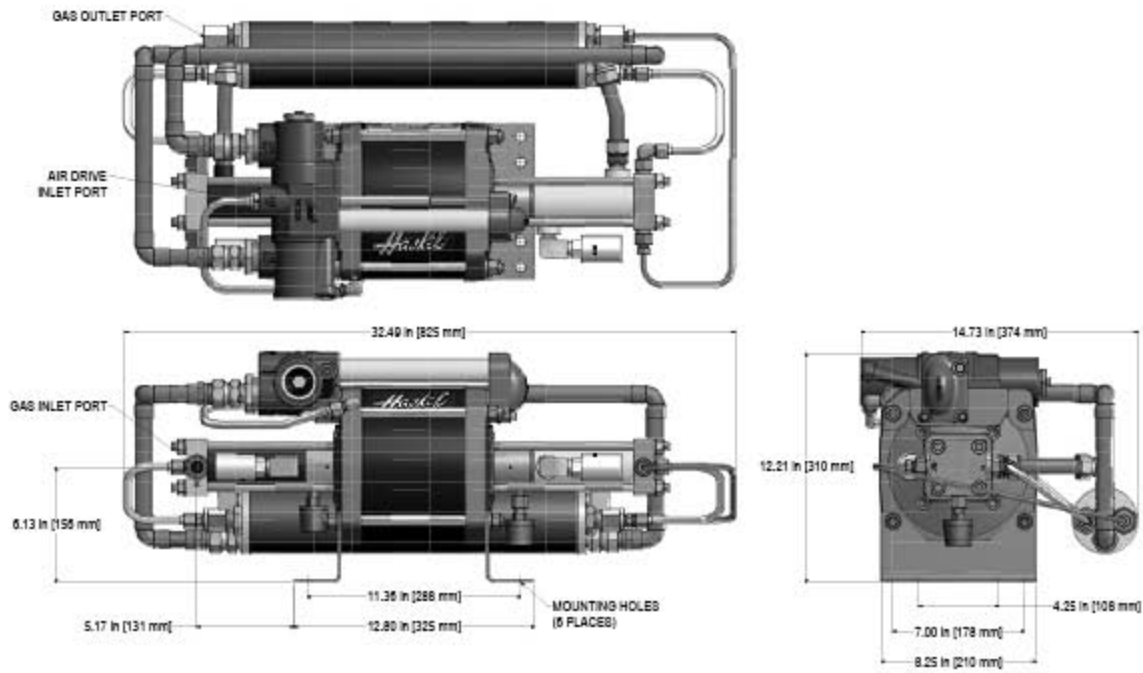
## Gas Booster Model: 8AGT-5/14



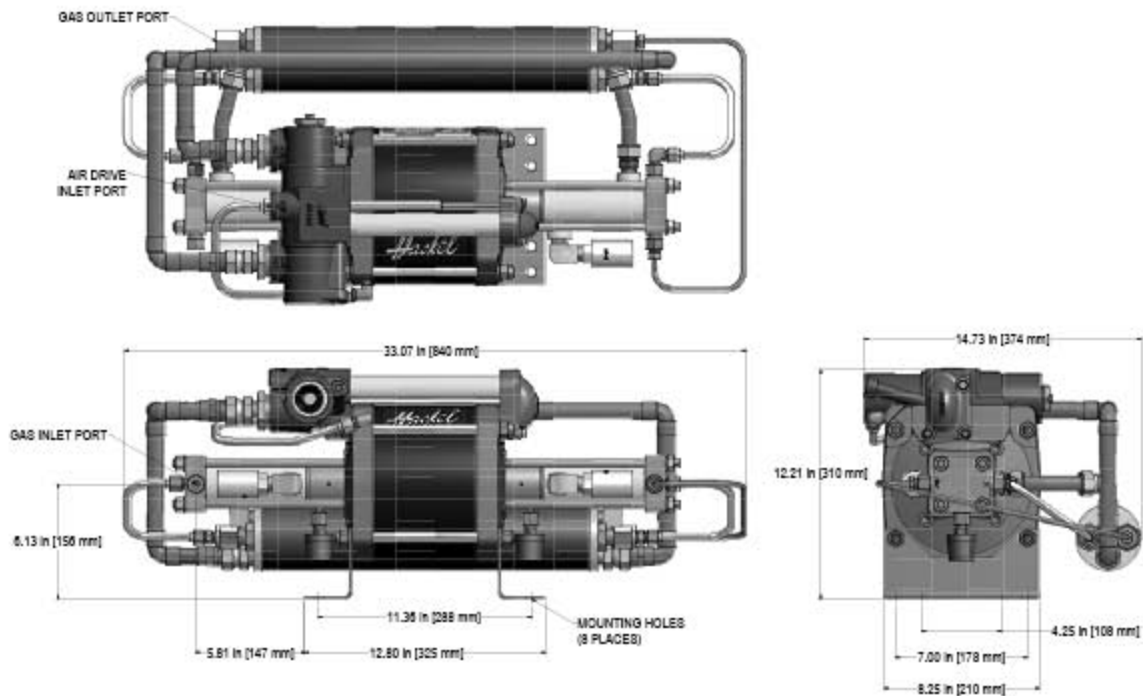
## Gas Booster Model: 8AGT-5/30



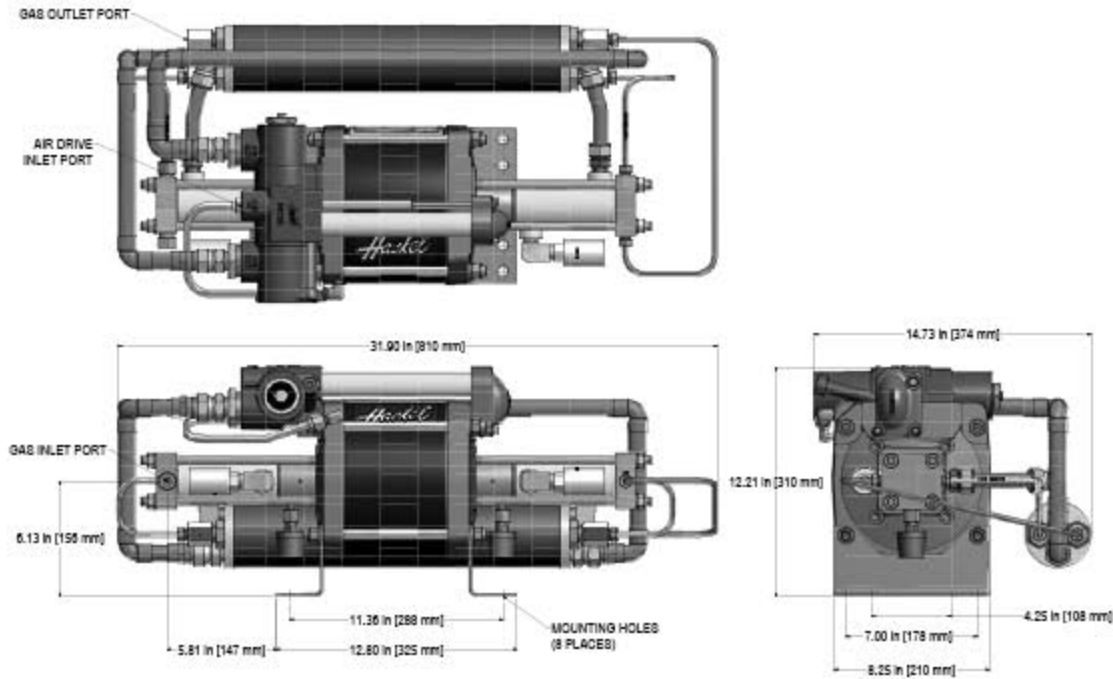
## Gas Booster Models: 8AGT-14/30, 8AGT-14/60



## Gas Booster Model: 8AGT-30/60

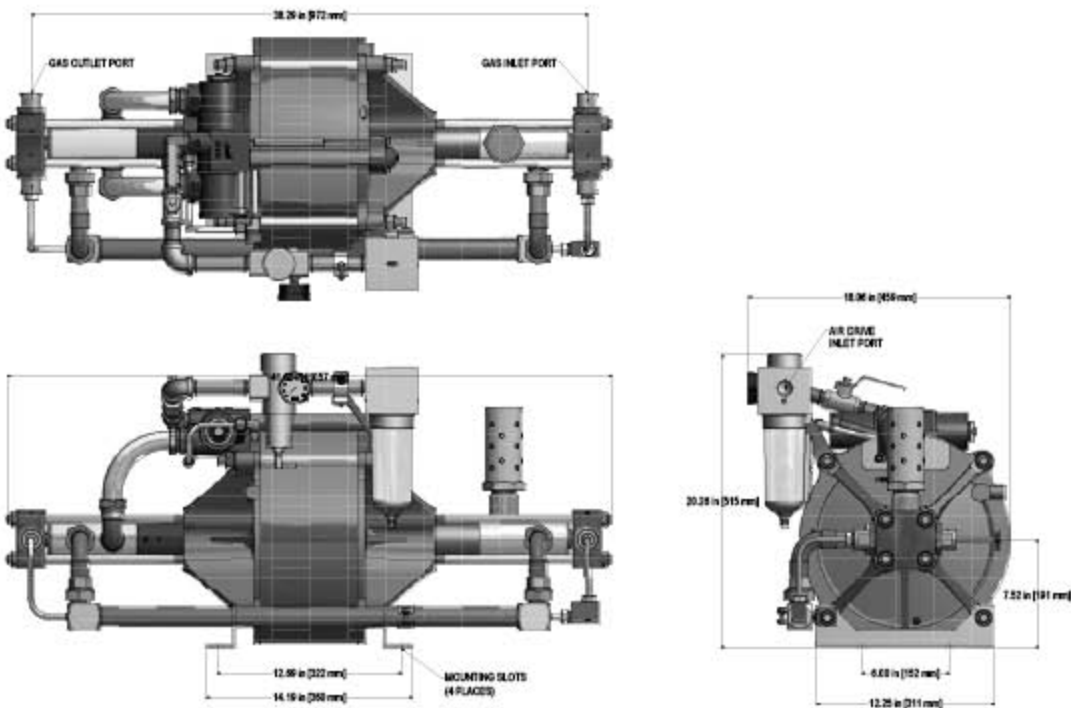


## Gas Booster Model: 8AGT-60/150

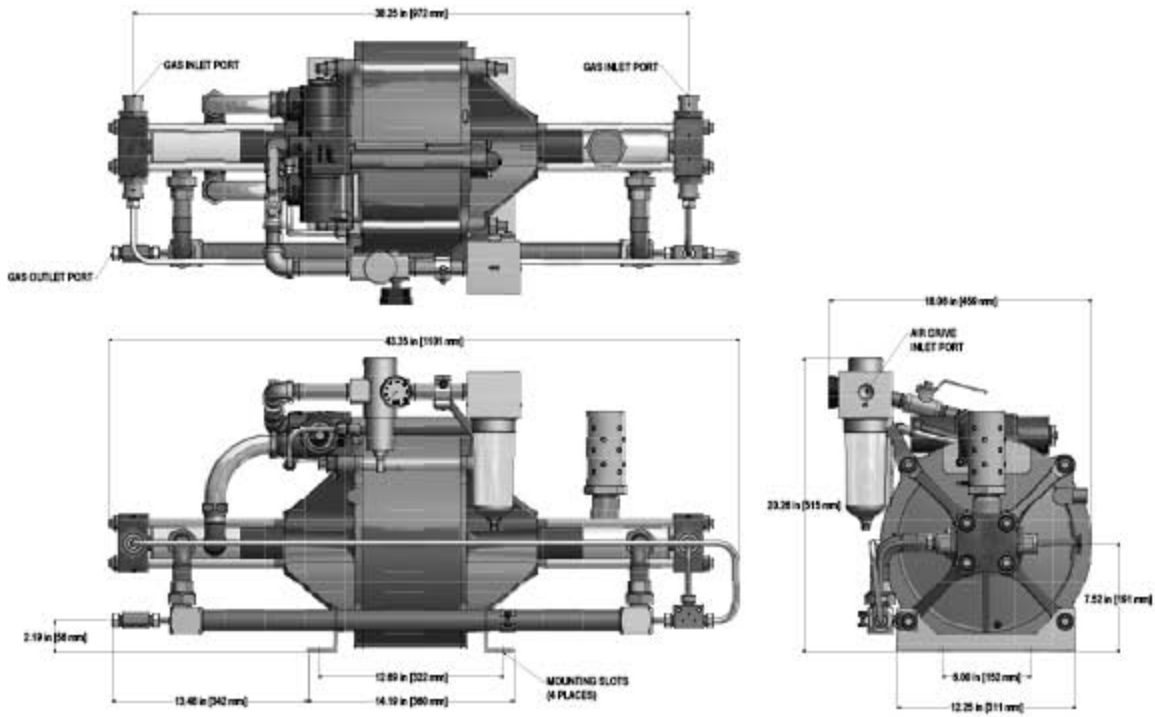


14" Series Gas Boosters Air Drive Inlet Port = 3/4" FNPT all Models

## Gas Booster Model: 14AGT-125/315



# Gas Booster Model: 14AGD-125, 14AGD-315



# Hydraulic Driven Gas Booster Dimensional Drawings

## Hydraulic Connections:

120HGD10, 120 HGT10 models : 1 in SAE female ports (2) rated at 3500 psi max.

100HGD6, 100HGT6 models : 1/2 in SAE female ports (2) rated at 3500 psi max.

## Gas Connections:

120HGD10, 120 HGT10, 100HGD6, 100HGT6 models ratios:

-50, 3/4 in SAE female port (Inlet), 9/16 M/P BuTech Port (2 ports each dbl acting, single two stage), Outlet rated 16,000 psig, 120 series, 13,500 psig 100 series, Inlet ports 6500 psig both series

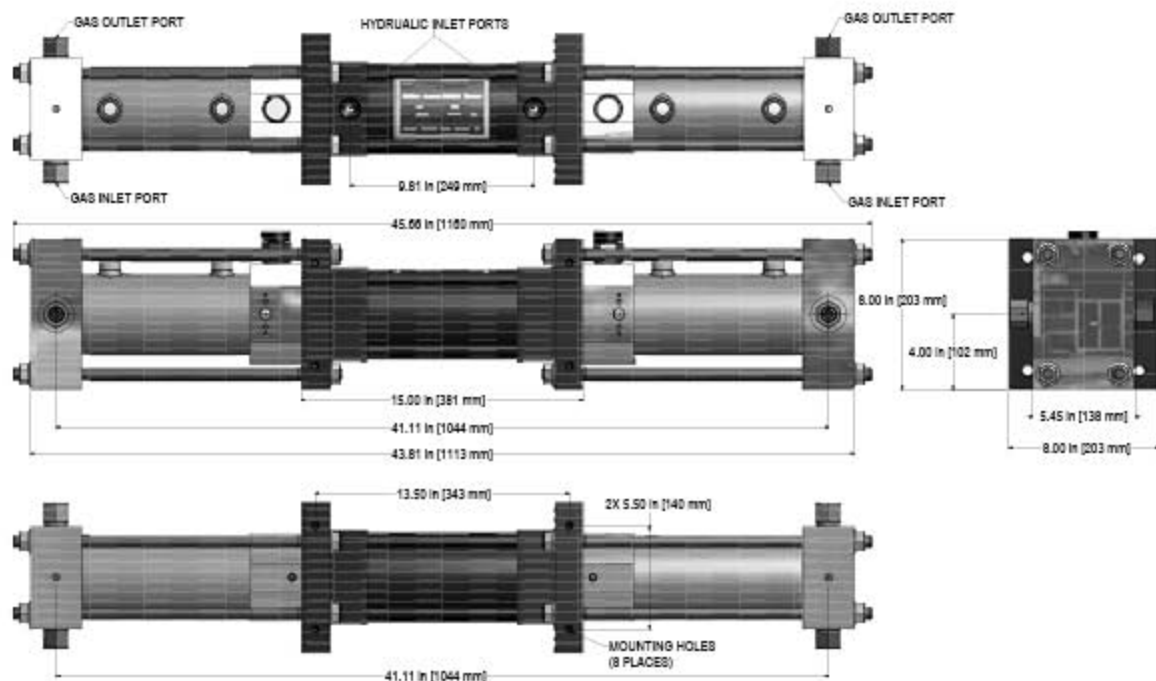
-85, 1 in SAE female port (Inlet), 3/4 in SAE female port (Outlet) (2 ports dbl acting, single two stage), Outlet rated 6,500 psig, both series, Inlet ports 6000 psig both series

-115, 1 in SAE female port (Inlet), 3/4 in SAE (outlet), (2 ports each dbl acting, single two stage), rated 3600 psig

-145, 1 in SAE female port (Inlet), 3/4 in SAE (outlet), (2 ports each dbl acting, single two stage), rated 2250 psig

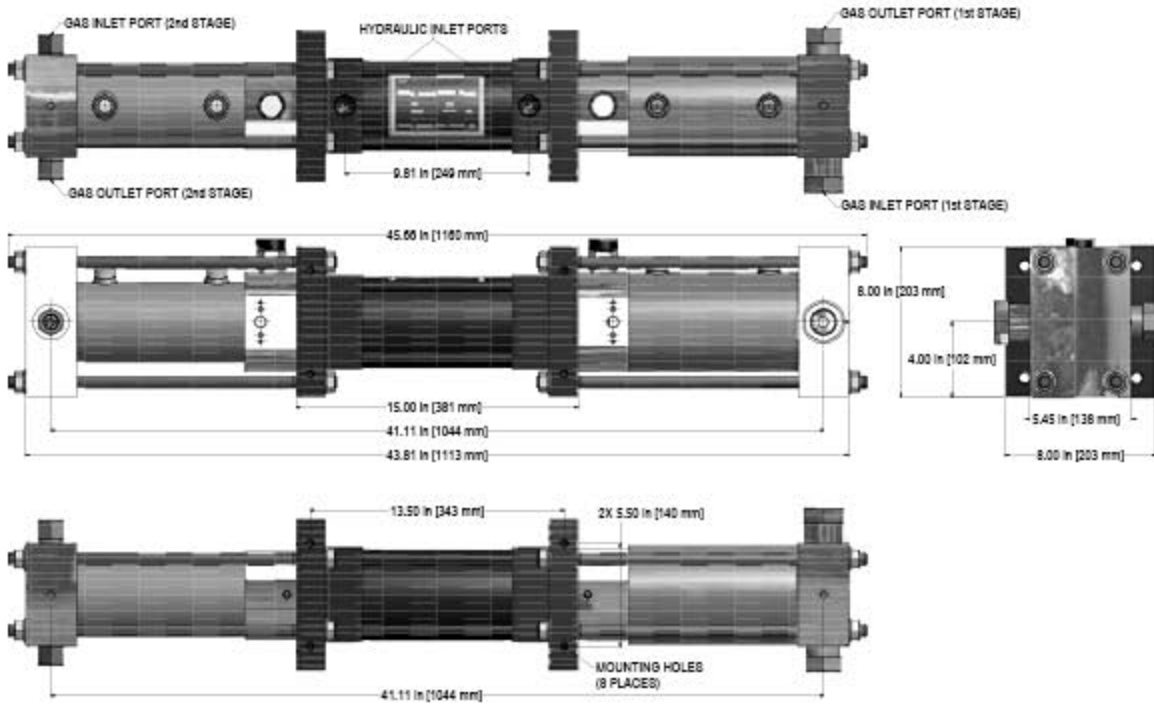
-105, 1 in SAE female port, (2 ports each dbl acting, single two stage), rated 1850 psig

## Gas Booster Model: 100HGD6-50, 100HGD6-85, 100HGD6-115, 100HGD6-145

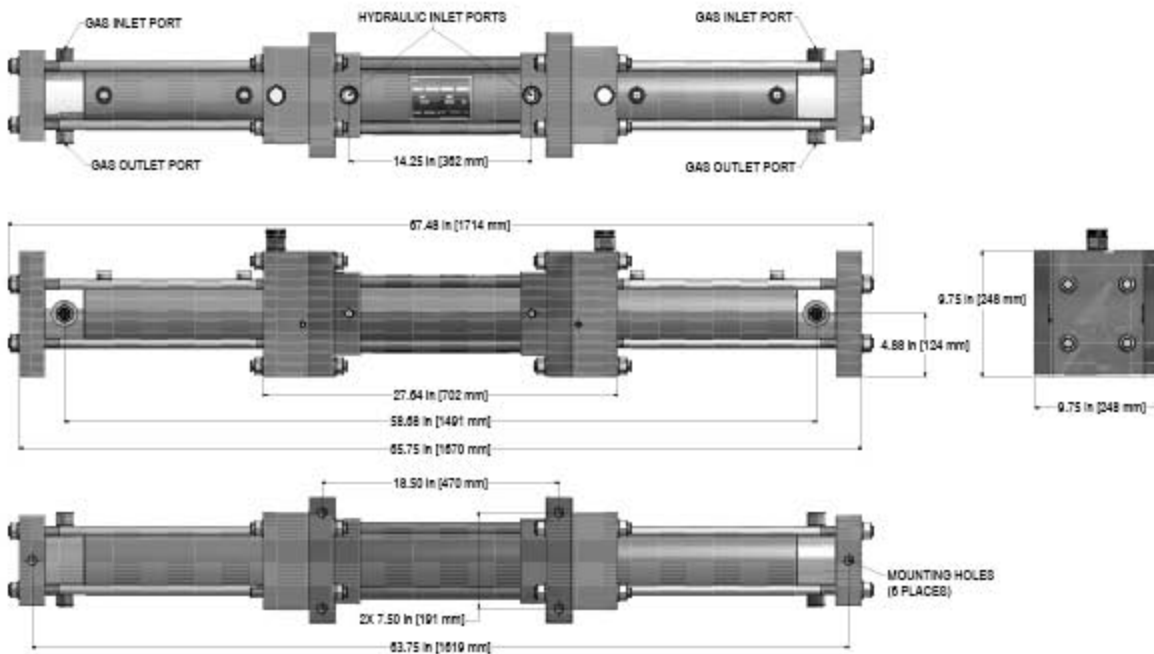




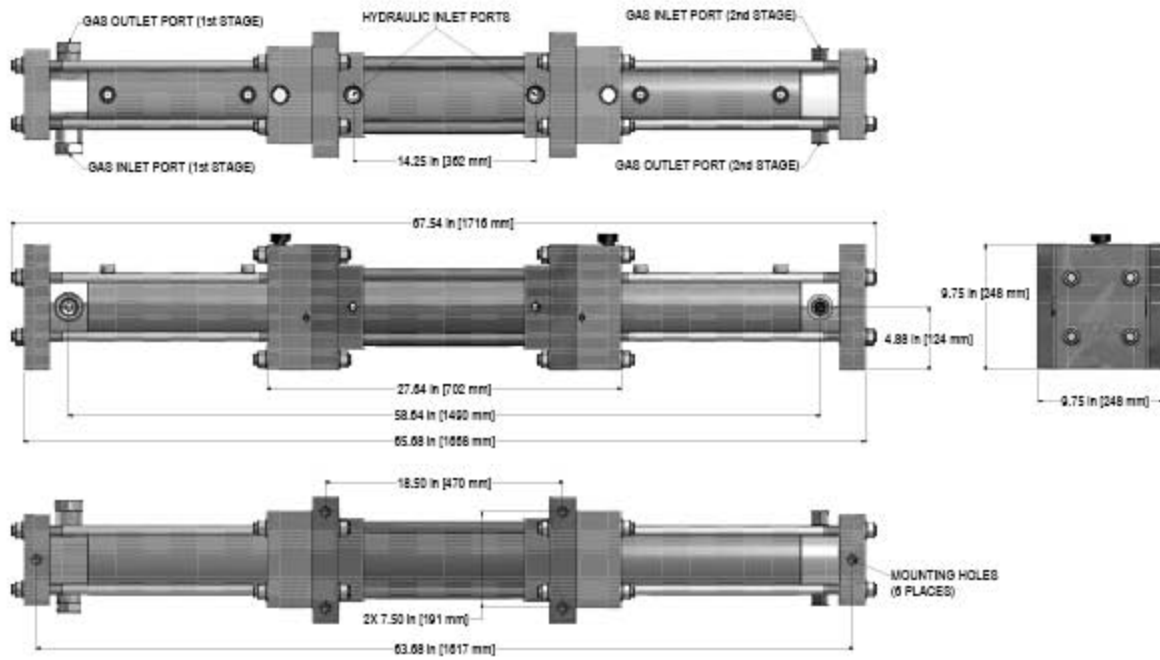
## Gas Booster Model: 100HGT6-85/50, 100HGT6-145/50



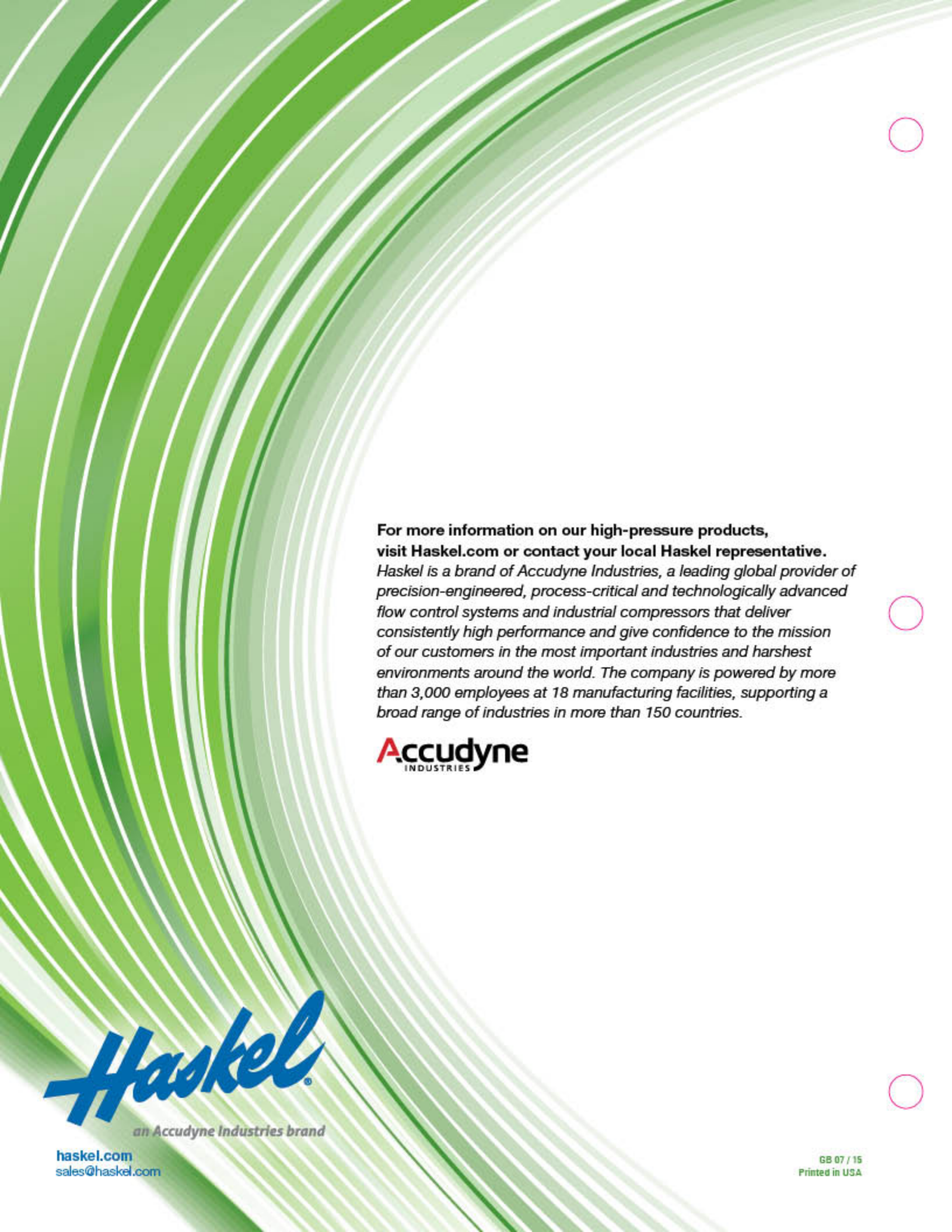
## Gas Booster Model: 120HGD10-50, 120HGD10-85, 120HGD10-165



# Gas Booster Model: 120HGT10-85/50, 120HGT10-165/85







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