

(Chart A)

**AIRFORCE PUMPS
SYSTEM DEMAND /REGULATOR SETTINGS**

At approx. 50' TDH (21.6 PSIG)".

F-100 MODEL

<u>SYSTEM DEMAND</u>	<u>REGULATOR SETTINGS</u>
25 GPM @ 30 PSI	50 PSI
30 GPM @ 35 PSI	70 PSI
39 GPM @ 35 PSI	100 PSI
42 GPM @ 40 PSI	130 PSI

F-150 MODEL

<u>SYSTEM DEMAND</u>	<u>REGULATOR SETTINGS</u>
50 GPM @ 40 PSI	60 PSI
74 GPM @ 35 PSI	85 PSI
84 GPM @ 35 PSI	100 PSI
92 GPM @ 40 PSI	130 PSI

“STANDARD” GAS CYLINDER SPECIFICATIONS (US)

<u>*300 CU. FT./"OVER-FILL"</u>	<u>NORMAL TYPE USED</u>
9.25" DIA. X 55.00" HIGH	135 LBS. WEIGHT
2,400 PSI	CAPACITY: 307/337 CU. FT. @ 70 DEGREES FAHRENHEIT

<u>*400 CU. FT./"OVER-FILL"</u>	<u>OPTIONAL: WHEN AVAILABLE</u>
10.53" DIA. X 59.00" HIGH	172 LBS. WEIGHT
2,400 PSI	CAPACITY: 406/440 CU. FT. @ 70 DEGREES FAHRENHEIT

(Chart B)

**AIRFORCE PUMPS
COMPRESSED GAS CONSUMPTION GUIDE**

F-100 MODEL - (1") @ 50' TDH (21.6 PSIG)

<u>WATER DISCHARGE</u>	<u>GAS USED</u>
25 GPM	.625 SCFM/GALLON (US)
30 GPM	.94 SCFM/GALLON (US)
39 GPM	1.15 SCFM/GALLON (US)
42 GPM	1.38 SCFM/GALLON (US)

1.02 SCFM PER GALLON/AVERAGE

F-150 MODEL - (1 ½") @ 50' TDH (21.6 PSIG)

<u>WATER DISCHARGE</u>	<u>GAS USED</u>
50 GPM	.80 SCFM/GALLON (US)
74 GPM	1.01 SCFM/GALLON (US)
84 GPM	1.07 SCFM/GALLON (US)
92 GPM	1.14 SCFM/GALLON (US)

1.005 SCFM PER GALLON/AVERAGE

Note: *We recommend that Nitrogen cylinder(s) be *leased* from local industrial/medical gas vendor. Most gas vendors *will not fill cylinders owned by others.*

(Chart C)

**Worksheet For Determining Gas Storage Required For
AIRFORCE PUMPS**

System GPM Req. _____ @ _____ PSI / from hydraulic calculations by others.

Select an Airforce Model Pump from Chart "A": F-100 _____ F-150 _____

Select a Cylinder regulator Setting in PSI _____ for GPM: _____ (From Chart "A")

See Gas Consumption Rate from Chart "B": _____ SCFM rate X _____ GPM = _____
SCFM* Total Per Minute

SCFM* multiplied by Desired Duration of Flow: _____ X _____ Minutes = _____ SCFM Total

SCFM X 10% or 20% (Safety Margin) = _____

Adjusted Total SCFM / 300 (or 400 SCFM) per Cylinder = _____ Cylinders*

*Cylinder levels must be monitored regularly. NEVER allow capacity to drop below 90% of full volume

*We recommend that Nitrogen cylinder(s) be *leased* from local industrial/medical gas vendor. Most gas vendors will not fill cylinders owned by others.

SAVE THIS WORKSHEET TO APPLY GAS LEVEL STICKERS TO REGULATOR GUIDE

FOR NITROGEN CYLINDER LEASING IN YOUR AREA CONTACT :

AIRGAS CORPORATION

MR. PETE LUKOSCHEK

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INSTRUCTIONS FOR USING CHART “C”

1. Obtain a hydraulic calculation sheet for the installation. Locate system GPM and Head Pressure in PSI demands.
* For this exercise, we will use 30 GPM @ 35 PSI.
2. Insert figures in first line spaces #1 and #2.
3. Go to Chart “A”, and select a pump model based on system demand.
* A model F-100 will fit our needs here so place a check after the model number, Line #3 or #4
4. Still on Chart “A”, select a regulator setting to meet the GPM and PSI you desire.
* For the F-100 model, a regulator setting of 70 PSI will deliver 30 GPM @ 35 PSI..
Insert 70 PSI in line #5 and 30 GPM in line #6.
5. Go to Chart “B” for Gas Consumption Guide. Our F-100 pump will consume .94 cubic feet of Nitrogen per gallon of water discharged.
* Insert .94 in line #7, and 30 GPM in line #8. Multiplying #7 X #8 = 28 cubic feet consumed per minute of water flow at max output. Write 28 in line #9.
6. Write 28 SCFM in line #10 and the duration of flow desired in minutes in line #11.
* We will use the duration of 10 minutes.
7. Multiply #10 and #11 for the total amount of cubic feet of gas required for 10 minutes of flow.
* 28 SCFM X 10 minutes equals 280 cubic feet of Nitrogen. Insert 280 in line #12.
8. Safety Margin. In order to provide a small reserve of gas for owner testing we suggest adding from 10% to 20% to the total storage calculated above.
* We will use 20% in line #13, for an adjusted total of 336 cubic feet of Nitrogen.
9. Nitrogen gas is available in both 400 and 300 cubic feet cylinders.
* For our installation, we would need one 400 cubic foot, or two 300 cubic foot cylinders.
Insert your choices on the line #14.

Your Exercise is completed.

EXAMPLE SHEET w/step #'s to complete worksheet from Chart "C" instructions

(Chart C)

**Worksheet For Determining Gas Storage Required For
AIRFORCE PUMPS**

System GPM Req. _____ 1 _____ @ _____ 2 _____ PSI / from hydraulic calculations by others.

Select an Airforce Model Pump from Chart "A": F-100 _____ 3 _____ F-150 _____ 4 _____

Select a Cylinder regulator Setting in PSI _____ 5 _____ for GPM: _____ 6 _____ (From Chart "A")

See Gas Consumption Rate from Chart "B": _____ 7 _____ SCFM rate X _____ 8 _____ GPM = _____ 9 _____
SCFM* Total Per Minute

SCFM* multiplied by Desired Duration of Flow: _____ 10 _____ X _____ 11 _____ Minutes = _____ 12 _____
SCFM Total

SCFM X 10% or 20% (Safety Margin) = _____ 13 _____

Adjusted Total SCFM / 300 (or 400 SCFM) per Cylinder = _____ 14 _____ Cylinders*

*Cylinder levels must be monitored regularly. NEVER allow capacity to drop below 90% of full volume

*We recommend that Nitrogen cylinder(s) be *leased* from local industrial/medical gas vendor. Most gas vendors will not fill cylinders owned by others.

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EXAMPLE SHEET w/example calculations explained in Chart “C” instructions

(Chart C)

**Worksheet For Determining Gas Storage Required For
AIRFORCE PUMPS**

System GPM Req. 30 @ 35 PSI / from hydraulic calculations by others.

Select an Airforce Model Pump from Chart “A”: F-100 X F-150 _____

Select a Cylinder regulator Setting in PSI 70 for GPM: 30 (From Chart “A”)

See Gas Consumption Rate from Chart “B”: .94 SCFM rate X 30 GPM = 28 SCFM* Total Per Minute

SCFM* multiplied by Desired Duration of Flow: 28 X 10 Minutes = 280 SCFM Total

SCFM X 10% or 20% (Safety Margin) = 336

Adjusted Total SCFM / 300 (or 400 SCFM) per Cylinder = 1/400 or 2/300 Cylinders*

*Cylinder levels must be monitored regularly. NEVER allow capacity to drop below 90% of full volume

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