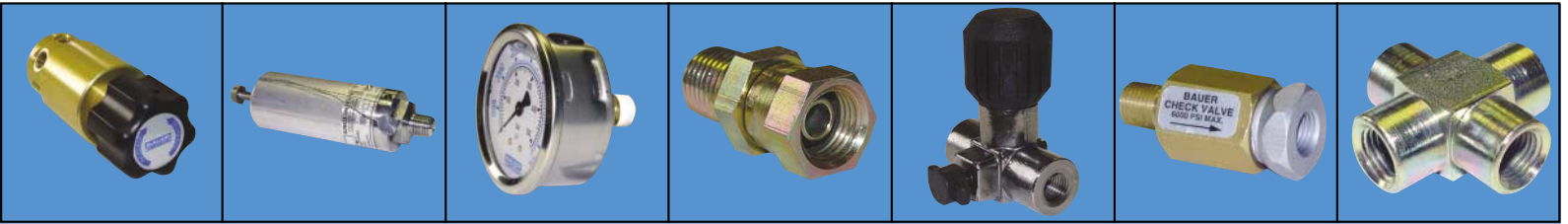


# Storage Systems and Accessories

High Pressure Air and Inert Gases



**4500 - 6000 PSIG  
DOT and ASME Cylinders**

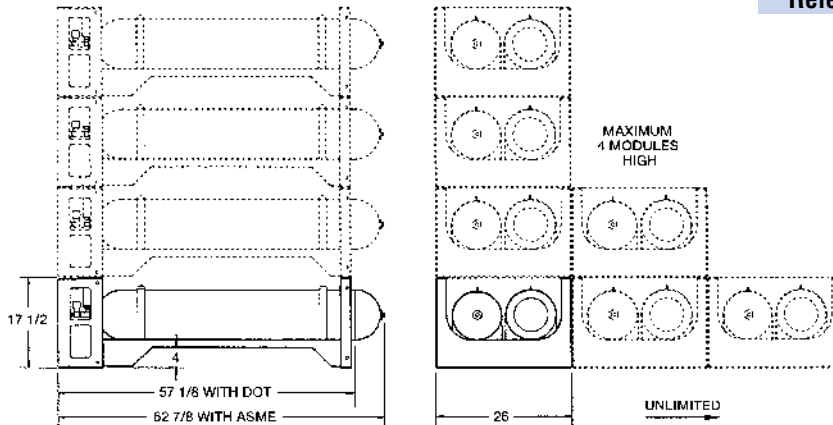
# High Pressure Storage Systems

If an application requires storage, either in the form of a single cylinder or multiple cylinders, arranged either for bulk or in banks for cascading, a properly sized storage system offers many benefits to the compressed air/gas system. The main purpose of storage is to serve as a reservoir to handle constant, sudden or unusually high demands for air/gas that can exceed the capacity of the compressor. Storage protects the compressor from the direct demand of the system and will dampen or eliminate pressure pulsations to the system. Each high pressure

application must be carefully reviewed to determine the best type and size of storage to use. The cost of equipment and operational and maintenance costs can be reduced by properly matching the compressor to the storage system. BAUER recommends that the compressor does not start more than 4 times per hour to avoid short-cycling of the compressor. Short-cycling can be detrimental to the compressor, motor, compressor control system and to the high pressure system. This brochure will serve as a guide to selecting the best storage system solution for your application.

## Horizontal Configurations

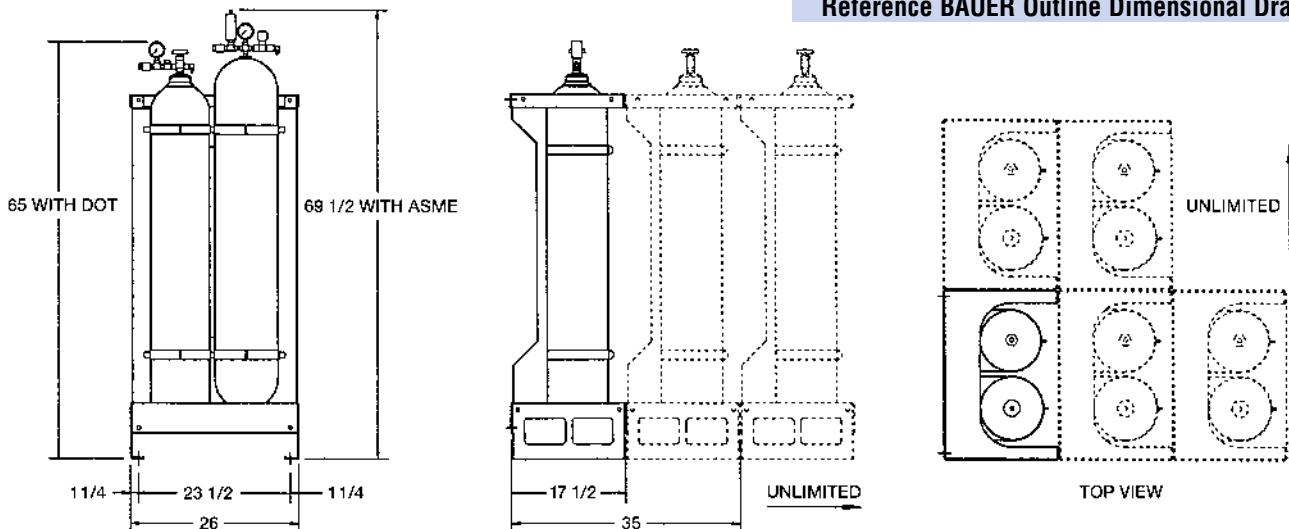
Reference BAUER Outline Dimensional Drawing ASY-0758



WEIGHTS FOR 2-CYLINDER RACK-MOUNTED ASSEMBLIES	
ASME	925 lbs
DOT 4500	415 lbs
DOT 5000	450 lbs
DOT 6000	500 lbs

## Vertical Configurations

Reference BAUER Outline Dimensional Drawing ASY-0759



# Technical Data

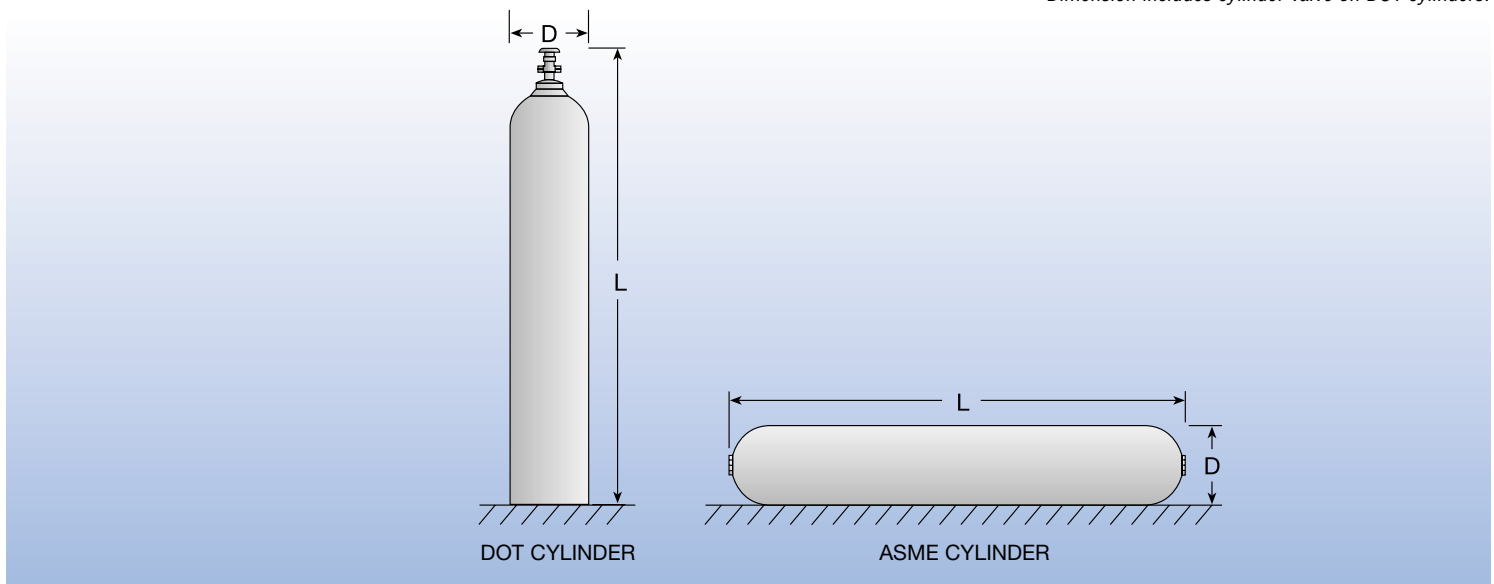
## Storage Cylinders

Air cylinders for storage are available to meet the code requirements of either the American Society of Mechanical Engineers (ASME) or the Department of Transportation (DOT).

The table below provides a summarization of technical data for cylinders offered by BAUER when storing air. Refer to the back page of this brochure for technical data when storing inert gases.

MODEL	PRESSURE RATINGS WORKING / TEST PSIG	WATER VOLUME cu in / cu ft	AIR CAPACITY AT WORKING PRESSURE SCF	DIMENSIONS* INCHES	WEIGHT LBS
DOT 4500	4500 / 6750	2750 / 1.59	444	9.31 OD x 55 L	144
DOT 5000	5000 / 7500	2750 / 1.59	472	9.38 OD x 55 L	158
DOT 6000	6000 / 9000	2640 / 1.53	509	9.28 OD x 55 L	188
ASME 5000	5000 / 10500	2590 / 1.47	436	9.62 OD x 54 L	400
ASME 6000	6000 / 10500	2590 / 1.47	491	9.62 OD x 54 L	400

\*Dimension includes cylinder valve on DOT cylinders.



**ASME storage systems to 7000 PSI available. Contact BAUER for assistance.**

Bulk storage for limiting the number of compressor starts to 4 times per hour can be calculated by the following formula:

$$VR = 58 \times (QC / \Delta P)$$

Where:

- VR = Volume of storage, cubic feet water volume
- QC = Capacity of compressor, standard cubic feet per minute (scfm)
- ΔP = Approximate deadband of final pressure switch, pounds per square inch (psid)

Multiple cylinders can be used for applications that require a large volume of storage.

Contact BAUER for sizing storage with multiple banks for cascading.

WORKING PRESSURE PSIG	ΔP (PSID)
4500	450
5000	500
6000	600






Cubic Feet = Gallons x 0.134  
Gallons = Cubic Feet x 7.48

# DOT Storage Systems

MODEL		DESCRIPTION
4500 PSI	CYL-0013	DOT cylinder manufactured in accordance to DOT-E 9421 specification. 444 SCF capacity referenced to 70°F and 4500 PSIG. Nominal water volume 1.59 cubic feet. Includes dual port manifold valve with 1/4" NPT ports 180° apart. Valve includes a pressure relief device. Weight, 144 lbs. empty.
	HC4500-1/BULK	DOT 4500 PSI single cylinder assembly for bulk storage. Includes 1 CYL-0013 with pressure gauge, check valve and hose connectors supplied loose.
	HC4500-1/BANK	DOT 4500 PSI single cylinder assembly for bank storage (for use with a BAUER Cascade Panel). Includes 1 CYL-0013 with 1 hose connector and 1 plug supplied loose.
5000 PSI	CYL-0062	DOT cylinder manufactured in accordance to DOT-E-10869-5000 specification. 472 SCF capacity referenced to 70°F and 5000 PSIG. Nominal water volume 1.59 cubic feet. Includes cylinder valve with CGA 347 connection. Valve includes a pressure relief device. Weight, 158 pounds empty.
	HC5000-1/BULK	DOT 5000 PSI single cylinder for bulk storage. Includes 1 CYL-0062 with pressure gauge, check valve, miscellaneous pipe fittings, and pipe and hose connectors supplied loose for customer assembly.
	HC5000-1/BANK	DOT 5000 PSI single cylinder assembly for bank storage (for use with a BAUER cascade panel). Includes 1 CYL-0062 with 1 hose connector.
6000 PSI	CYL-0011	DOT cylinder manufactured in accordance to DOT-E 9909 specification. 509 SCF capacity referenced to 70°F and 6000 PSIG. Nominal water volume 1.53 cubic feet. Includes dual port manifold valve with 1/4" NPT ports 180° apart. Valve includes a pressure relief device. Weight, 188 lbs. empty.
	HC6000-1/BULK	DOT 6000 PSI single cylinder assembly for bulk storage. Includes 1 CYL-0011 with pressure gauge, check and hose connectors supplied loose.
	HC6000-1/BANK	DOT 6000 PSI single cylinder assembly for bank storage (for use with a BAUER Cascade Panel). Includes 1 CYL-0011 with 1 hose connector and 1 plug supplied loose.

Additional cylinders are available for Bulk or Bank assemblies. Includes cylinder valve, interconnecting pigtail and miscellaneous fittings. Change model number to reflect number of cylinders (i.e. HC6000-2/BULK, HC6000-3/BANK) Hose connectors can be removed for 1/4" NPT pipe connection.

**The mandatory retest period for these DOT cylinders is every five (5) years. Under no circumstances are these cylinders to be filled to a pressure exceeding the marked service pressure at 70° F.**

ACCESSORIES FOR DOT CYLINDERS		
PART	PART NUMBER	DESCRIPTION
	ADP-0058	Adapter, CGA 347 Male x 1/4" NPT Female, Stainless Steel.
	NUT-0043	Nut, CGA 347, Stainless Steel. Use with NIP-0117.
	NIP-0117	Nipple, CGA 347 x 1/4" NPT Male, 3" Length, Stainless Steel with Hard Seat. Use with NUT-0043.
	VAL-0351	Valve, dual outlet manifold valve for DOT 4500 cylinders. Includes two (2) 1/4" NPT ports and pressure relief device. Ports are 180° apart.
	VAL-0352	Valve, dual outlet manifold valve for DOT 6000 cylinders. Includes two (2) 1/4" NPT ports and pressure relief device. Ports are 180° apart.
	NOT AVAILABLE	Valve, CGA 347 for DOT 5000 cylinders. Includes pressure relief device.

All DOT cylinders are shipped with a protective cap for the cylinder valve. Valve caps are shipped installed on loose cylinders and shipped loose with racked assemblies.

# ASME Storage Systems

MODEL		DESCRIPTION
5000 PSI and 6000 PSI	CYL-0009	ASME cylinder, 436 SCF referenced to 70° F & 5000 PSI; 491 SCF at 6000 PSI; 537 SCF at 7000 PSI. Nominal water volume 1.47 cubic feet. Section VIII MAWP = 5250 PSI, Appendix 22 MAWP = 7000 PSI. Weight, 400 lbs. empty. ASME Section VIII, Division 1 latest edition for non-corrosive service only.
	SAS-1-5K/BULK	5000 PSI ASME cylinder bulk storage assembly. Includes cylinder valve, drain valve, ASME relief valve, 1/4" hose connector and plug supplied loose.
	SAS-1-5K/BANK	5000 PSI ASME cylinder bank storage assembly for use with a cascade panel. Includes cylinder valve, drain valve, ASME relief valve, 1/4" hose connectors, pressure gauge and check valve supplied loose.
	SAS-1-6K/BULK	6000 PSI ASME cylinder bulk storage assembly. Includes cylinder valve, drain valve, ASME relief valve, 1/4" hose connector and plug supplied loose.
	SAS-1-6K/BANK	6000 PSI ASME cylinder bank storage assembly for use with a cascade panel. Includes cylinder valve, drain valve, ASME relief valve, 1/4" hose connectors, pressure gauge and check valve supplied loose.

Additional cylinders available for Bulk or Bank assemblies. Additional cylinders include cylinder valve, ASME relief valve, drain valve, interconnecting pigtail and miscellaneous fittings. Change model number to reflect number of cylinders (i.e. SAS-2-5K/BULK, SAS-3-6K/BANK). Hose connectors can be removed for 1/4" NPT pipe connection.

**All components are supplied loose from DOT and ASME cylinders unless purchased factory installed in a rack. Installation, assembly and interconnecting piping to the system are the responsibility of the installer.**

RACKS AND RACK ACCESSORIES FOR DOT AND ASME CYLINDERS		
PART	PART NUMBER	DESCRIPTION
	RCK-0037	Universal two position steel rack. Designed for horizontal or vertical configuration and suitable for stationary or mobile applications. Multiple racks can be bolted together to form larger storage systems. Each rack includes four sets of cylinder clamps. Specify the type of cylinder and rack configuration at order placement. Reference drawings for available configuration schemes and dimensions. Mounting hardware for installation is not included. Weight, 125 lbs.
	DOT-2*	Unistrut channel and two clamp sets, one for each DOT cylinder. For use with DOT cylinders only. Channel must be anchored to a vertical surface. Mounting hardware for installation of the rack is not included. See below for ordering racks for additional cylinder positions.
	CMP-0106	Clamp set for DOT cylinders. Includes fastening hardware.
	CMP-0027	Clamp set for ASME cylinders. Includes fastening hardware.

\*Additional mounting positions available. Change model name to reflect number of positions (i.e. DOT-3, DOT-4)



# Piping Accessories

High Pressure Air and Inert Gases

PART	PART NUMBER	DESCRIPTION
<b>VALVES (LINE, VENT, CHECK)</b>		
	VAL-0006	Line Valve, 1/4" NPT Female Inlet x 1/4" NPT Male Outlet
	VAL-0076	Panel Mounted Version of VAL-0006
	VAL-0316	Line Valve with Vent, 1/4" NPT Female. Vent valve vents the downstream side of the valve.
	065126	Vent Valve, 1/4" NPT Female, 5000 PSI
	VAL-0377	Vent Valve, 1/4" NPT Female x 1/4" NPT Male
	VAL-0140	Vent Valve, 1/4" NPT Male, 10,000 PSI
	VAL-0007	Check Valve, 1/4" NPT Female Inlet x 1/4" NPT Male Outlet
	VAL-0176	Check Valve, 1/4" NPT Male Inlet x 1/4" NPT Female Outlet
<b>PIPE FITTINGS</b>		
	CON-0017	1/4" NPT Nipple with Hex Wrench Surface
	CON-0018	1/4" NPT Coupling with Hex Wrench Surface
	CON-0042	1/4" NPT Cross, Female
	ELL-0017	1/4" NPT Elbow, Female
	ELL-0018	1/4" NPT Elbow, Female x Male
	ELL-0058	1/4" NPT Elbow, Male
	PLU-0004	1/4" NPT Plug
	TEE-0012	1/4" NPT Tee, Female with Male Run
	TEE-0013	1/4" NPT Tee, Female
	TEE-0014	1/4" NPT Tee, Female with Male Branch
	TEE-0036	1/4" NPT Tee, Male with Female Branch
	TEE-0040	1/4" NPT Tee, Male

# System Accessories

## High Pressure Air and Inert Gases

PART	PART NUMBER	DESCRIPTION
<b>REGULATORS</b>		
	REG-0003	Adjustable Regulator, 6000 PSI In, 5000 PSI Out. 1/4" NPT Ports for Inlet, Outlet and 2 Gauge Ports.
<b>HOSE FITTINGS, HOSE &amp; HOSE ASSEMBLIES</b>		
	ADP-0004	Adapter, 1/4" NPT Female Swivel x 1/4" Male
	CON-0039	Pipe to Hose Connector, 1/4" NPT Male x 37° Flare (JIC)
	ELL-0031	Pipe to Hose Elbow, 1/4" NPT Male x 37° Flare (JIC)
	HOS-0120	2-ft Hose, 6000 PSI, 1/4" NPT Male x 37° Flare (JIC) Female Swivel
	HOS-0121	3-ft Hose, 6000 PSI, 1/4" NPT Male x 37° Flare (JIC) Female Swivel
	HOS-0123	5-ft Hose, 6000 PSI, 1/4" NPT Male x 37° Flare (JIC) Female Swivel
	HOS-0125	10-ft Hose, 6000 PSI, 1/4" NPT Male x 37° Flare (JIC) Female Swivel
	HOS-0127	15-ft Hose, 6000 PSI, 1/4" NPT Male x 37° Flare (JIC) Female Swivel
	HOS-0128	20-ft Hose, 6000 PSI, 1/4" NPT Male x 37° Flare (JIC) Female Swivel
HOS-0129	25-ft Hose, 6000 PSI, 1/4" NPT Male x 37° Flare (JIC) Female Swivel	
	BFFD-347	5-ft Fill Hose Assembly, 1/4" NPT Male x BFFD-347 Connector. Includes Line Valve with Vent and Pressure Gauge.
<b>TUBE FITTINGS &amp; TUBING</b>		
	CON-0030	1/4" Tube x 1/4" NPT Male
	ELL-0028	1/4" Tube Elbow x 1/4" NPT Male
	ELL-0056	1/4" Tube Elbow x 1/4" NPT Female
	TEE-0037	1/4" Tube Tee x 1/4" NPT Male Branch
	TEE-0038	1/4" Tube Tee x 1/4" NPT Male Run
	TEE-0039	1/4" Tube Tee x 1/4" NPT Female Branch
	TUB-R-0011	Seamless Stainless Steel Tubing, 1/4" OD x 0.049" Wall Thickness. Rated To 7500 PSIG. Available Only in 5-ft Lengths.
	TUB-0517	1/4" Tube Pigtail, Made From TUB-R-0011, Approximately 24" Overall Length. Use for Interconnecting Storage Cylinders.
<b>PRESSURE GAUGES</b>		
	GAG-0009W	Pressure Gauge, 0-7500 PSI, 2 1/2" Gauge Face, Liquid Filled. 1/4" Center Back Mount (male) with U-Clamp.
	GAG-0070W	Pressure Gauge, 0-7500 PSI, 2 1/2" Gauge Face, Liquid Filled 1/4" Bottom Connection (male).
<b>RELIEF VALVES</b>		
	VAL-0022	ASME Relief Valve, factory set at 5250 PSI. ASME cylinder must be protected by an ASME relief valve. 1/4" NPT male connection.
	VAL-0154	ASME Relief Valve, factory set at 6500 PSI. ASME cylinder must be protected by an ASME relief valve. 1/4" NPT male connection.
	VAL-0169	Relief Valve, Adjustable to 6500 PSI. This relief valve is not suitable for use on DOT or ASME cylinders. It can be used downstream of a pressure regulator and in other locations for overpressure protection. 1/4" NPT Male Connection. Factory set at customer specified pressure.

# Technical Data

## High Pressure Air and Inert Gases

### COMPRESSIBILITY OF GASES, VOLUMETRIC

The table below lists the volume of different gases that can be compressed into one (1) cubic foot water volume at the given pressure. The information is based on 70° F and accounts for the compressibility of the gas. The table can be used to calculate the volume of air or gas that can be stored in a cylinder of known water volume. Likewise, the water volume of a cylinder can be calculated if the capacity of air or gas stored in the cylinder is known.

GAUGE PRESSURE PSIG	AIR SCF	NITROGEN SCF	ARGON SCF	HELIUM SCF
1000	70.29	69.30	71.79	66.37
1500	104.77	102.74	108.50	98.12
2000	137.77	134.90	145.30	128.55
2500	169.11	165.39	181.50	158.08
3000	198.96	193.82	216.30	186.78
3200	209.83	204.61	229.70	198.03
3500	226.14	220.26	249.20	214.66
4000	251.34	244.39	279.90	241.79
4200	260.98	253.51	291.60	252.44
4500	274.85	266.60	308.30	268.19
4700	283.54	275.07	319.10	278.55
5000	296.57	286.67	334.40	293.90
5200	304.84	294.39	344.30	304.00
5500	316.03	305.80	358.40	318.95
6000	334.06	322.77	380.30	343.37

- Example 1: Find the volume of air a DOT 6000 cylinder will hold at 5000 PSIG.  
 DOT 6000 = 1.53 CF water volume  
 @ 5000 PSIG, 296.57 SCF air / SCF water volume  
 $1.53 \times 296.57 = 453 \text{ SCF}$
- Example 2: If a cylinder is known to hold 200 SCF of Argon at 2000 PSIG, what is its water volume?  
 @ 2000 PSIG, 145.3 SCF Argon / SCF water volume  
 $200 \text{ SCF} / 145.30 \text{ SCF/SCF} = 1.38 \text{ SCF (water volume)}$
- Example 3: How many 45 SCF (air volume) tanks can be filled from 0 to 4500 PSIG from two DOT 6000 cylinders arranged for bulk storage?  
 DOT 6000 = 1.53 CF water volume, 509 SCF each, 1018 SCF for 2  
 @ 4500 PSIG, each DOT 6000 cylinder will hold  $1.53 \text{ SCF} \times 274.85 \text{ SCF/SCF} = 420 \text{ SCF}$   
 Available volume from each cylinder,  $509 \text{ SCF} - 420 \text{ SCF} = 89 \text{ SCF}$ , 178 SCF from 2  
 Number of fills,  $[(89 \text{ SCF} \times 2) / 45 \text{ SCF}] = 4 \text{ tank fills}$ , figure 3 tank fills to be conservative

This brochure includes information for the most common storage systems and accessories offered by BAUER. Many other varieties of accessory components and custom storage systems are available. Contact a BAUER sales representative for assistance.

High pressure storage systems and their accessories must be installed, maintained and operated only by trained individuals. Misuse can result in personal injury or death.

BAUER recommends the use of high pressure stainless steel tubing for permanent installations. High pressure hose should be used for temporary use only.

Items shown in this brochure are suitable for use with air, nitrogen, argon and helium, and are not intended for oxygen service.

BAUER COMPRESSORS, INC. continuously reviews their products' design and performance to better to serve our customer's needs. Therefore, information contained herein is subject to modification without notice or obligation.

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