



BOILER ROOM SERVICES, INC.

P.O. Box 558

Imperial, PA 15126

Phone: 724-695-8110

Fax: 724-695-8115

service@boilerroomservices.com

www.boilerroomservices.com

PLANNED MAINTENANCE WORK AGREEMENT PMWA

Boiler Room Services, Inc offers a PLANNED MAINTENANCE WORK AGREEMENT (PMWA) which can be tailored to our customers' needs and requirements. PMWA is broken down into four parts, BOILER CLEANING, MACHICANICAL SAFETY TESTS, ELECTRICAL SAFETY TESTS, and COMBUSTION TUNING. This has been developed as a result of over our 30 years of servicing the boiler industry. Using the ASME CSD-1, NFPA 8501, and ASME Section VI and VII each part of the PMWA is designed to add reliability, safety, and efficiency to the customer's boiler plant. We approach our service with a total system approach, based on Naval Basic Propulsion Engineering training and Naval Boiler training.

An equipment data sheet recording all control, burner management and system components, such as gas, oil, and manual fuel valves will be made recording manufacture, model number, part number and date manufactured.

Our customer's can elect to purchase all four parts of the PMWA or supplement their own program with BRS as a third party verifying safety checks and combustion tuning, thereby meeting ASME CSD-1 and NFPA requirements for third party testing.

Industrial or commercial plant reliability and overall system efficiency will be improved with proper maintenance along with reduction of unplanned plant outages. In an economy where every energy dollar and man hour counts these reductions can add to a profitable business or reduce overhead to a school, hospital, or church.

Along with a signed PMWA contract we are able to offer **reduced service rates both for normal and emergency calls. The following are descriptions of each part of the PMWA. Choose only the program(s) that best fit into you present maintenance program or have BRS take care of all your boiler needs.**

1. **BOILER CLEANING;** Boiler cleaning is scheduled into a plant shutdown or during off use periods, such as summer months on heating boilers. It's best scheduled in conjunction with the code/state boiler inspector. The boiler will be open both on waterside and fireside and thoroughly cleaned prior to code inspection. All handhole, manhole, water level control and inspection plugs will have been removed and our trained service technicians will have inspected the boiler before the code inspector has arrived. Eliminating the surprise of a code inspector failing a boiler on a code problem or a failed component.
2. **MECHANICAL SAFETY CHECKS;** Mechanical checks are completed to prove each fuel valve (manual & electric) is properly working and has seal tight closure when in the off condition. These are completed for both gas and oil valves on the main and pilot fuel trains. All gas and oil piping will be leak tested. All vent piping will be opened to check that pressure switches and regulator diaphragms are not leaking to atmosphere. Boiler safety valves will be hand tested along with pressure lifting if allowed by code inspector.
3. **ELECTRICAL SAFETY CHECKS;** All NFPA 70-E PPE requirements will be followed during the tests. Electrical test will be completed on each operating control, excessive limit control, low water cut-off. The control operating condition will be recorded along with control scale and actual trip point. All Burner Management trips and lock-outs will be recorded for each control. Control switches will be tested under operation to be sure of operating condition. Recommendations will be made for any un-safe condition or panel improvement to meet the requirements of NFPA 70-E. All additional work required will require written approval before being completed.
4. **Combustion tests** will be done for each fuel. The test will be completed for each point of characterization of adjustable flow control valve or at burner firing rates low, mid, and high fire. The test will meet all requirements of EPA or DER yearly tests proving original factory performance has been maintained. This test can be completed on both low Nox and standard burners. All test equipment will be certified by third party compliance requirements or certified by original equipment manufacture for calibration and accuracy.



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PLANNED MAINTENANCE WORK AGREEMENT PMWA

This Planned Maintenance Work Agreement Hereinafter designated "PMWA" is between BOILER ROOM SERVICES, INC. hereinafter designated "*Company*", and _____ hereinafter designated "*Customer*".

The term of this agreement shall commence on the _____ day of _____, _____ and shall continue for a period of one (1) year from commence date.

A. COMPANY'S OBLIGATIONS

Company hereby agrees to provide the following planned maintenance work on the equipment described and listed in Equipment Schedule attached to this PMWA as Exhibit "A" and recorded work on equipment as listed on attached Exhibit "B":

1. Complete planned maintenance work on equipment as set forth in Exhibit "A".
2. Furnish reports for PMWA completed and include recommendations for needed repairs on Exhibit "B".
3. Instruct operator, during planned maintenance work, in the proper operation of the equipment.
4. All work shall be performed by qualified technicians.
5. Company shall issue insurance certificate upon request.

B. CUSTOMER'S OBLIGATIONS

1. For the PMW to be provided hereunder, Customer hereby agrees to pay to the Company the total sum of \$ _____ during the terms of this Agreement, payable NET 15 DAYS from date of service. The payment due hereunder will be firm for term of Agreement, but may be revised by Company upon furnishing a notice to Customer in writing of such revision at least forty-five (45) days prior to any anniversary of the commencement date of this PMWA. The revision shall become effective on the next anniversary date succeeding the date of the notice.

2. Customer further agrees to:

- a. Operate the equipment in accordance with original manufactures and Company instructions.
- b. Promptly notify Company of any unusual operating conditions.
- c. Maintain a spare parts inventory in accordance with Company recommendations.
- d. Keep the equipment room and space clean and in proper order.
- e. Extend to Company all available facilities on premises and usual building maintenance material and tools.
- f. Advise Company in writing of its authorized person or persons to order repair, replacements, or other labor and equipment where Customer shall be bound thereby.

C. SPECIAL CONDITIONS

1. Any work other than the inspections provided for hereunder shall be performed only upon Customer's authorization and will be billed at Company discounted service rates associated with signed agreement.
2. Replacement parts and material are not included within the PMWA obligations of Company under this Agreement and will be invoiced separately.
3. The rates provided for hereunder are predicated on the fact that all PMWA shall be conducted during the hours from eight o'clock A.M. to five o'clock P.M. on Monday through Friday, holidays excepted. If for any reason, Customer requests that inspections be conducted during hours or days other than the above listed, Customer agrees to reimburse Company for any additional cost, including premium pay.
4. Company shall not, under any circumstances, be held liable or responsible for any loss damage, costs and expenses incurred by Customer which are caused by failure to perform or by delay in its performance of the PMWA described herein.
5. The parties hereto acknowledge that the normal operation of the equipment is a function of the Customer and therefore agree that Company shall not be held liable or responsible for the failure of the equipment or its controls, or for obsolescence.
6. Company, shall not, under any circumstances, be liable for any accident, injury, breakage, loss or damage of or to the equipment covered hereunder or to any machinery, appliances or other property or for bodily injury to or the death of any person, unless such accident, breakage, loss, damage or injury is caused by negligent acts of omission or commission by Company agents or employees.
7. Company reserves the right to discontinue the service provided hereunder at any time, without notice, until all payments required under this PMWA have been made as agreed.
8. This agreement constitutes the entire contract between the parties hereto, and there are no other understandings, representations or promises, oral or written, relating to the subject matter of this PMWA. This PMWA may not be changed, modified, or amended, in whole or in part, except in writing, signed by both parties and no agent or employee shall have authority to waive any clause of this agreement.
9. This PMWA shall be effective only upon signature by the President of the Company.
10. This agreement shall consist of the PMWA, Exhibit A, and Exhibit B.

D. COMPANY STANDARD TERM AND CONDITIONS APPLY. WHERE THERE IS A CONFLICT BETWEEN SPECIAL CONDITIONS AND STANDARD TERMS AND CONDITIONS, COMPANY STANDARD TERMS AND CONDITIONS ARE CONTROLLING DOCUMENT.

Customer's Acceptance

BOILER ROOM SERVICES, INC.

Firm Name _____

By _____

Signature _____

Title _____

Title _____

Signature _____

Date _____

Approval Date _____

BOILER ROOM SERVICES, INC. PREVENTIVE WORK AGREEMENT

EXHIBIT "A" EQUIPMENT DATA SHEET

CUSTOMER/JOB NUMBER

Boiler Manufacture					
Capacity		National Board		Serial No.	
Horsepower		Heating Surface		Type	
Year Built		MAWP		Safety Relief	
Type		Rating		Order #	

Safety Valve

	Manufacture	Model	Date Code	Lift Point	Set Point	Capacity
Valve 1						
Valve 2						
Valve 3						

Burner Information

Burner Manufacture		Model		Serial No.	
Fuel:		Order #		UL #	
Max. input		Min input		Other	

Burner Management Control

	Manufacture	Model	Date Code	Notes
Controller				
Display				
Purge Timer				
Flame Amplifier				
Programmer				
Scanner/Flame Rod				
Ignition Transformer				

Main Gas Train

	Manufacture	Size	Model	Type	Range	Date Code
Upsteam Manual Valve						
Regulator						
Regulator Spring						
Low Gas Pressure Switch						
Primary Electric Valve						
Primary Valve Actuator						
Vent Valve						
Vent Valve Actuator						
Secondary Electric Valve						
Secondary Actuator						

Modulating Valve						
Modulating Actuator						
Downstream Manual Valve						
Pilot Gas Train						
	Manufacture	Size	Model	Type	Range	Date Code
Manual Upstream Valve						
Regulator						
Regulator Spring						
Primary Electric Valve						
Primary Actuator						
Vent Valve						
Secondary Electric Valve						
Secondary Actuator						
Manual Downstream Valve						
Pressure/Temperature Controls						
	Manufacture	Model	Type	Range	Date Code	
Operating Temperature Limit						
Excess Temperature Limit						
Operating Pressure Control						
Excessive Pressure Limit						
High Gas Pressure Limit						
Low Gas Pressure Limit						
High Oil Pressure Limit						
Low Oil Pressure Limit						
Atomizing Air Pressure Limit						
Combustion Air Pressure Limit						
Combustion Air Pressure Purge Limit						
Furnace Pressure Limit						
Combustion Control						
	Manufacture	Model	Type	Range	Date Code	
Modulating Actuator/Motor Control						
Modulating Pressure Control						
Modulating Temperature Control						
Low Fire Start Switch						
Purge Proving Switch						
AC/DC Control Transformer						
Low Fire Temperature Hold						

Water Level Controls							
		Manufacture	Model	Type	Range	Date Code	
Low Water Cut-out							
Low Water Alarm							
Low Water Cut-out							
Low Water Alarm							
High Water Alarm							
Probe Holder							
Probe Length A							
Probe Length B							
Probe Length C							
Water Side Gaskets							
		Manufacture	Model-Size	Material	Rating	Qty	
Handhole							
Manway							
Low Water Cut- Off							
Low Water Cut- Off							
Fireside Side Gaskets							
		Manufacture	Model-Size	Material		Qty	
Door Front							
Door Rear							
Door Inspection							
Burner							
Blower Information							
		Manufacture	Model-Size	Material	Rating	Qty	
Blower Information							
Direct Drive							
Bearing Inner							
Bearings Outer							
Wheel Dia.							
Belt Drive							
Belt							
Motor Sheave							
Blower Sheave							
Motor Information							
Motor	Manufacture	Voltage/Phase	FL Amp	Frame	Serial #	Type	
Motor Starter							
Overloads							
Fuses							

Fuel Oil Pump							
		Manufacture	Model-Size		Material	Pressure Rating	Flow Capacity
Oil Pump							
Motor	Manufacture	Voltage/Phase	FL Amp	Frame	Serial #	Type	
Motor Starter							
Overloads							
Fuses							

Fuel Oil Controls							
		Manufacture	Model-Size		Material	Pressure Rating	Flow Capacity
Pressure Regulator							
Back Pressure Regulator							
Pressure Gauge Pump Suction							
Pressure Gauge Pump							
Pressure Gauge Burner							
Upsteam Manual Valve							
Regulator							
Back Pressure Regulator							
Regulator Spring Range							
Primary Electric Valve							
Primary Valve Actuator							
Pressure Vent Valve							
Vent Valve Actuator							
Secondary Electric Valve							
Secondary Valve Actuator							
Modulating Valve							
Modulating Actuator							
Downstream Manual Valve							

Atomizing Air Compressor							
		Manufacture	Model-Size		Material	Pressure Rating	Flow Capacity
Compressor							
Motor	Manufacture	Voltage/Phase	FL Amp	Frame	Serial #	Type	
Motor Starter							
Overloads							
Fuses							

EXHIBIT "B"
BOILER ROOM SERVICES, INC.
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Phone 724-695-8110 Fax 724-695-8115
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Boiler Cleaning Report Sheet

Customer Name		
Customer Boiler #		
Technician Name Print		
Technician Name Signature		

BOILER DATA	Manufacture		Model	
	Date Built		Capacity	NB #
	SN		UL #	Other ID
INSURANCE REQUIREMENTS				

Description of Work	Date Complete	Comments
1. Drain and flush the waterside of the boiler, removing all loose scale, sludge, and foreign material. All solid materials must be placed in a drum for disposal by Customer.		
2. Remove all handhole and manhole covers and gaskets for inspection of watersides by the boiler inspector. Clean all gasket surfaces and protect with anti-size compound.		Customer responsible for scheduling code/insurance inspector for all boiler code inspections
3. Remove front and rear fireside plates or open doors to provide access to the rear tube sheet.		
4. Thoroughly clean the fireside of the boiler and all tubes. Mechanically wire brush all tubes to remove scale and dirt. All solid materials must be placed in a drum for disposal by Customer.		
5. All tubes, front and rear tubesheets will be inspected for cracks, deep gouges, and distortion by the boiler inspector. The Vendor shall repair all defects per written change order.		

EXHIBIT "B"
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Boiler Cleaning Report Sheet

Customer Name		
6. Installation of new tubes, weld repairs, where needed, as determined by change order, shall be completed as follows:		
a. Remove specified tube or tubes		
b. Metal removed from rear tubesheet, as a result of removing the welded seal end of a second pass tube, is to be repaired by welding and then ground within 1/8" to the tube sheet surface.		
c. Install the new tube conforming to specification ASTM-A-178A, 12 gauge. Tube ends shall extend 1/8 inch beyond the tube sheet. Tube ends at the beginning of the second pass are to be expanded and seal welded, then re-rolled. All other tube ends are to be expanded, flared, and extended beyond the tube sheet 1/8 to 3/8 inch.		
d. Relief valves are to be removed or blanketed off and the boiler hydrostatically tested to pressure requirement of code inspector. It is required that the minimum temperature of the water be 70F and the maximum 160F. All controls and appurtenances unable to withstand the required test pressure without damage should be removed during the test. The hydrostatic test pressure shall be held for a minimum of 30 minutes prior to examining for leakage, and the hydrostatic test pressure of specified leak test pressure shall be held for such additional time as may be necessary to conduct the leakage examination. The hydrostatic test will be witnessed by the boiler inspector.		
7. Open and clean water columns, water column pipe crosses or inspection plugs, make-up water controllers, low and high water cut-out controls. All controls will be checked by the boiler code inspector prior to closing.		
8. All connecting piping to controls (liquid and steam), pressure gauges, and water cut out controls will be opened for inspection.		

EXHIBIT "B"
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Boiler Cleaning Report Sheet

Customer Name			
9. Prior to closing the fireside, all fire brick and mill board insulation (asbestos-free) is to be repaired as necessary, using standard boiler construction materials subject to Customer approval. All new material supply must be asbestos free. Refractory or insulation requiring replacement will be completed by written approved change notice.			
10. Replace all broken stud bolts on front and rear covers of all boilers. Close up watersides using new gaskets for handholes and manholes. Close up front and rear doors using new gaskets (asbestos-free). All gasket surfaces will be cleaned prior to closing. All studs will be coated with anti-size compound prior to closing.			
11. Disassemble, clean, and inspect the burner assembly and combustion air fan. Replacement of belts will be completed by written change order.			

NOTE: See electrical test checkoff sheet for a list of controls for item # 7 above.

Customer Acceptance _____ Vendor's Signature _____

Date _____ Date _____

Mechanical Safety Check Report Sheet

Customer Name							
Customer Boiler #							
Technician Name Print							
Technician Name Signature							
BRS Job							
BOILER DATA		Manufacture				Model	
		Date Built		Capacity		NB #	
		SN		UL #		Other ID	
1. Visually inspect all gas, water, and vent lines.							
	Size	Type	Manufacture	Comments			Date
a. Gas							
b. Water							
c. Vent							
2. Leak test all main and pilot gas train piping.							
	Description	Condition		Comments			Date
a. Main							
b. Pilot							
3. Visually inspect all gas, steam and water gauges.							
a. Gas							
b. Steam							
c. Water							
d. Oil							

4. All relief valves are to be tested according to the ASME Boiler and Pressure Vessel Code							
	Description	Factory Set PSIG	Lift PSIG	Set PSIG	Comments		Date
	Relief Valve 1 -front						
	Relief Valve 2-mid						
	Relief Valve 3-rear						
5. Seal Tight Closure test will be done between the following valves on the main and pilot gas trains.							
Main Gas Train							
	Description	Seal tight Closure yes / no	Tested Set Point and Time Duration	Recommended Set Point	Comments		
	a. Between the upstream manual gas valve and the upstream electric valve.						
	b. Between the upstream electric valve and downstream electric valve and the normally open electric vent valve.						
	c. Between the normal operating electric vent valve and the atmosphere.						
	d. Between the downstream electric valve and the burner supervisory manual shut-off valve.						
	e. Between the main gas regulator diaphragm and the atmosphere						

Pilot Train						
	Description	Seal tight Closure yes / no	Tested	Recommended Set Point	Comments	Date
	a. Between the upstream manual valve and the upstream electric valve.					
	b. Between the upstream electric valve and downstream electric valve and the normally open electric vent valve.					
	c. Between the normal operating vent valve, electric and the atmosphere.					
	d. Between the downstream electric valve and the burner supervisory manual shut-off valve.					
	e. Between the pilot gas regulator and the atmosphere.					
6. Leak or bubble test all diaphragms on regulators and pressure controls.						
	Description	Leak / No	yes	Comments		Date
	Main Gas Regulator					
	High gas Pressure Switch					
	Low Gas Pressure Switch					
	Pilot Gas regulator					

7. Leak test all manual gas and water valves. To ensure valves and valve packing are secure.					
a. Gas					
b. Water					
c. Vent					

Customer Acceptance

Vendor's Signature

Date

Date

Electrical Test Report Sheet

Customer Name									
Customer Boiler #									
Technician Name Print									
Technician Name Signature									
BRS Job									
BOILER DATA		Manufacture		Model					
		Date Built		Capacity		NB #			
		SN		UL #		Other ID			
CUSTOMER INSURANCE REQUIREMENTS									
1. Visually inspect all wiring for worn insulation and loose connections.						Comments		Date	
2. Visually inspect all electrical components and manually operate each switch for proper operation.									
3. Inspect the operating pressure controls for the proper cycle of operations to the burner assembly.									
Control		Manufacture		Model		Scale Set Point	Actual Pressure Trip Point	Scale Range	Date
Operating Temperature Limit									
Low Water Cut Off									

4. Inspect the following interlocks to ensure that, when safety cut-out limits are met the boiler will shutdown, automatically lock-out, and alarm until manually reset.

	Manufacture	Model	Scale Set Point	Actual Pressure Trip Point	Scale Range	Date
Excess Temperature Limit						
Excessive Pressure Limit						
High Gas Pressure Limit						
Low Gas Pressure Limit						
High Oil Pressure Limit						
Low Oil Pressure Limit						
Atomizing Air Pressure Limit						
Combustion Blower Starter Interlock Switch						
Combustion Air Pressure Limit						
Combustion Air Pressure Purge Limit						
Furnace Pressure Limit						
Burner Door Interlock						

5. Inspect the combustion control, proof of purge, proper sequence of operation, including the opening and closing of the air damper at specified intervals.						
	Manufacture	Model	Scale Set Point	Actual Trip Point	Scale Range	Date
Modulating Actuator/Motor Control						
Modulating Pressure Control						
Modulating Temperature Control						
Low Fire Start Switch						
Purge Proving Switch						
AC/DC Control Transformer						
Low Fire Temperature Hold						
Water Level Controls						
	Manufacture	Model	Manufacture Lowest Allowed Height From Floor	Height From Floor	Actual Trip Point From Floor	Date
Low Water Cut-out						
Low Water Alarm						
Low Water Cut-out						
Low Water Alarm						
High Water Alarm						

	Comments	
6. Inspect the prepurge timing and prepurge air changes according to the manufactures specifications		
7. Inspect the proven pilot flame response time and shutdown sequence (burner locked in low fire)		
8. Inspect the flame failure response time of the main gas train.		

Boiler Codes - Mechanical

Customer Acceptance

Vendor's Signature

Date

Date

BOILER ROOM SERVICES, INC.

BOILER ROOM SERVICES, INC. 724-695-8110 Fax: 724-695-8110 E-Mail: service@boilerroomservice.com

Combustion Test Report Sheet

Customer Name												
Customer Boiler #												
Combustion Analyzer	Manufacture					SN						
Technician Name Print												
Technician Name Signature												
BOILER DATA												
Manufacture						Model						
Date Built					Capacity				NB #			
SN					UL #				Other ID			
BURNER DATA												
Manufacture						Model						
Date Built					Input Max				Input Min.			
SN					UL #				Other ID			
CUSTOMER INSURANCE REQUIREMENTS												
Firing Rate Test Point	Min	1	2	3	4	5	6	7	8	9	10	Max
Oil Supply - psi												
Oil Manifold. - psi												
Oil Burner - Psi												
Atomizing Pressure - Psi												
Oil Flow GPH												
Blower Wheel Inlet"wc												
Rear Combustion Chamber "wc												
Plenum Box - "wc												
Steam - psi												
Draft - "wc Outlet												
O2 - %												
CO - PPM												
CO2 - %m												
No2 - PPMVD												
NO - PPMVD												

BOILER ROOM SERVICES, INC.

Gross Stack - F												
Ambient - F												
Net - F												
Efficiency - %												
Main Flame - Volts												
Pilot Flame - Volts												
Notes:												

BOILER ROOM SERVICES, INC.

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Combustion Test Report Sheet

Customer Name			
Customer Boiler #			
Combustion Analyzer	Manufacture		SN
Technician Name Print			
Technician Name Signature			

BOILER DATA	Manufacture					Model						
	Date Built			Capacity			NB #					
	SN			UL #			Other ID					
BURNER DATA	Manufacture					Model						
	Date Built			Input Max			Input Min.					
	SN			UL #			Other ID					
CUSTOMER INSURANCE REQUIREMENTS												
Firing Rate Test Point	Min	1	2	3	4	5	6	7	8	9	10	Max
Gas Supply - psi												
Gas Reg. - psi												
Gas @ Burner - "wc												
Gas Flow CFH												
Rosemount Dif. "wc												
BlowerWheel Inlet"wc												
Rear Combustion Chamber "wc												
Plenum Box - "wc												
Steam - psi												
Draft - "wc Outlet												
O2 - %												
CO - PPM												
CO2 - %m												
No2 - PPMVD												
NO - PPMVD												
Gross Stack - F												
Ambient - F												
Net - F												
Efficiency - %												
Main Flame - Volts												
Pilot Flame - Volts												

USEFUL FACTORS

MULTIPLY

BY

TO OBTAIN

BOILER DATA

B.HP	33,479	btu/output @ 0 psig
B.HP	41,843	btu/input @ 80% EFF.
B.HP	34.5	lbs/hr./ steam @ 0 psig
B.HP	5	modern ft ³ heating surface
B.HP	9.809	kilowatts

FUEL DATA

FT ³ NATURAL GAS	1050	btus
GALS. #2 FUEL OIL	139,600	btus
GALS. #6 FUEL OIL	152,400	btus
PROPANE FT ³	2,550	btus
BUTANE FT ³	3,200	btus

COMBUSTION AIR

BTU/HR	10^{-2}	CFH combustion air required
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ELECTRIC DATA

KILOWATTS	10^{-3}	watts
WATTS	0.05692	btu/min
KILOWATTS	10^{-3}	btu/min
WATTS	3.415	kilowatts
WATT HOUR	3.415	btu
KILOWATT HOUR	3415	btu

TIME

WEEKS	168	hours
MONTHS	730	hours

PRESSURE

PSI	27.6778	inches of water
PSI	2.307	feet of water
PSI	2.036	inches of mercury
FEET OF WATER	0.4336	psig
INCHES OF WATER	0.03613	psig
INCHES OF WATER	0.5781	ounces per square inch

VOLUME

U.S. GALS	231	cubic inches
U.S. GALS	0.1337	cubic feet
U.S. GALS	8.33	lbs. water @ 20°
LBS. OF WATER	0.01602	cubic feet
LBS. OF WATER	27.68	cubic inches
LBS. OF WATER	0.1198	gallons