

# REFERENCE MANUAL

## POWER SMOKER 2™

Reference Manual and  
User's Guide





# Welcome

Thank you for purchasing Hurco's Power Smoker 2. The Power Smoker 2 was developed in 1999 to help plumbers find leaks in plumbing systems. The original use for the Power Smoker 2 was to find the source of sewer gas odors in buildings. The Power Smoker 2 worked so well, that plumbing contractors started using it to find leaks in new construction prior to the installation of walls and ceilings. Because we use our laboratory tested safe LiquiSmoke and we pump the exhaust through the plumbing, the Power Smoker 2 can be used indoors. With a patented smoke generating system, the Power Smoker 2 is the most economical smoker in the market today. Power Smoker 2 is also used by fire departments for low visibility training exercises.

Features of the Power Smoker 2 with LiquiSmoke:

- Find the source of sewer gas odors in seconds.
- Powerful enough to push smoke through the smallest leaks.
- LiquiSmoke will not leave stains or odors.
- Solid Cast Aluminum high pressure blower for the toughest jobs.

**Hurco Technologies, Inc.** would like to take this opportunity to welcome you as a new customer and user of the Power Smoker 2 with LiquiSmoke. You have just purchased the best smoke testing system available. The Power Smoker 2 is simple to use and will provide you with years of service.

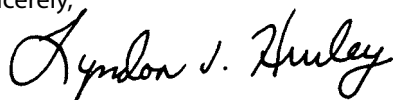
This manual will take you through the step by step procedures for using the Power Smoker 2. We use simple to understand instructions and photos to assist you in learning how to get the best results from your Power Smoker 2. Please follow each step completely to insure maximum performance from your Power Smoker 2.

Your Power Smoker 2 will give you many years of service if you take care of it as you would any expensive piece of equipment. The Power Smoker 2 is rugged and built to last. It will withstand the demands of your jobsite; however, is not abuse proof! Be sure to assign the use of your Power Smoker 2 to a competent worker who will take care of it.

In this manual, we will be giving you suggestions on basic smoke testing activities. As a general rule, these suggestions are based on standard procedures used by plumbing contractors throughout the United States and other countries.

If you have any questions regarding this manual or smoke testing in general, please call and ask for customer support at 1-800-888-1436.

Sincerely,



Lyndon J. Hurley  
President, Hurco Technologies, Inc.



**HURCO**  
TECHNOLOGIES, INC.



**POWER  
SMOKER 2**

**WARNING:** The Power Smoker 2 is not explosion proof. Do not start the Power Smoker 2 in the presence of volatile gases.

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**WARNING!**  
**READ ALL OPERATING MANUALS  
BEFORE OPERATION OF EQUIPMENT**

**GENERAL SAFETY INFORMATION**

**Machine Operation**

- Always wear protective clothing and safety glasses when operating machinery.
- Never service or repair Power Smoker 2 while running. Allow engine to cool.
- Whenever fueling the Power Smoker 2, shut off engine and do not smoke.
- Periodically inspect system components. Perform routine maintenance as required.
- Do not operate a gasoline engine in an enclosed area. Be sure the area is well ventilated.

**SAFETY FIRST!**

Even though you are using laboratory tested safe LiquiSmoke, gases from the sewer line may not be safe. Some of these gases can be very dangerous causing anything from minor health symptoms to death. The smoke is a visual indicator that you should evacuate the area immediately. If smoke is detected in a building, follow these procedures;

- If possible, open all doors and windows and evacuate immediately.
- Install a fan in a window or door to evacuate the smoke.
- Find a licensed plumber to fix the leak.
- Once the repair has been made, recheck the system using the Power Smoker 2.

Carbon Monoxide does travel with the smoke being generated by the Power Smoker 2. Under normal conditions, the amount of Carbon Monoxide emitted with the smoke is minimal and should not be a problem. However, as with any gas, if you let it accumulate it can build to dangerous levels. As a general rule, once you have discovered your leak, turn off the Power Smoker 2 immediately. **DO NOT ALLOW THE ROOM TO FILL WITH SMOKE.** If the room does fill with smoke due to a major break in the plumbing system, then quickly open all doors and windows and evacuate the building until the smoke has been cleared.

# Power Smoker 2 Setup for Plumbing Systems

Setting up your Power Smoker 2 for smoke testing a plumbing system involves some planning. The most important part of any smoke testing program is Occupant Notification. This should never be taken for granted. There will certainly be people with health concerns and businesses that cannot have business interrupted. It is natural to panic whenever you see smoke and occupant awareness will help alleviate that anxiety. Another major concern is the possible presence of dangerous sewer gases traveling with the smoke. Occupants should be made aware that if they see smoke to immediately vacate the area and notify you of the leak.

## Occupant Notification

Occupant Notifications can be delivered in a number of different ways:

- Inter office communications or e-mail
- PA announcements
- Personnel Contact

All Occupant Notification Announcements need to be timed so that the occupants do not forget the day you will be performing this activity. If you let the occupants know in advance, it is still a wise practice to make an announcement the day of your tests.

## Preparing for Smoke Testing

### UNDERSTAND THE FLOOR PLAN

It is important to plan your smoke testing activities carefully. You will want to prepare a floor plan map of the plumbing to be tested. This map should identify:

- The direction of sewer flow.
- The size of the pipes.
- The cleanouts where you will connect the Power Smoker 2.
- Rooms that may require special attention.
- Occupants with health concerns.
- Any other items of concern should also be noted.

### SETTING UP THE CREW

One person is all that is required for a smoke testing program but, a second person can speed up the process of finding the leak. These people should be trained in the proper procedures of smoke testing plumbing systems. There is no room for errors when doing smoke testing.

### REQUIRED EQUIPMENT

- Power Smoker 2 with LiquiSmoke
- Extra gas for Power Smoker 2
- Cell phone for emergencies

- Video or digital camera gear
- Laser light pen and marker tags.
- Note pad with pen or pencil

## Before you start your test

1. Read all warnings on the Power Smoker 2 before operation.
2. Check oil and gas before starting the Power Smoker 2.
3. Be sure the air damper plate is installed with the red adjustment knob.
4. Make a positive connection to the plumbing system at the cleanout.
5. The Power Smoker 2 generates so much smoke that it is not necessary to plug roof vents. However, if you are concerned about smoke emitting from the roof vent, you can plug the vent without affecting the test.
6. Prepare the LiquiSmoke Tank.
  - a. To relieve pressure from the tank before filling, rotate the small valve to the right slowly until fully open. Leave relief valve open until all pressure is relieved. The canister is now safe to open. **Never open canister without first releasing pressure.**
  - b. Put one gallon of LiquiSmoke in the LiquiSmoke pressure tank
  - c. Place pump back into tank and turn clockwise until tight.
  - d. Disengage the pump handle by turning it  $\frac{1}{4}$  turn and pump tank until firm. Do not apply too much pressure to the pump handle as it will damage the pump cartridge. Note: Putting more than one gallon of LiquiSmoke in this container will cause you to make several trips back to the Power Smoker 2 to keep the LiquiSmoke under pressure. By leaving the tank half full, you will have an adequate amount of pressure to last the entire test. **Warning:** The LiquiSmoke pressure tank is now under pressure and **DANGEROUS. Always wear eye protection when using this container.**

**WARNING!** Smoke testing can be dangerous. Do not use in areas where there are volatile gases.

**WARNING!** Using any liquid product to produce smoke other than Hurco's LiquiSmoke can cause damage to the Power Smoker 2, voiding any warranty. Also, some of these liquids can start on fire or become an explosion hazard.

**WARNING!** Power Smoker 2 is not designed to be used with zinc chloride smoke bombs. Not only are these smoke bombs corrosive to the working components of the Power Smoker 2, they can cause serious damage to the engine.

**WARNING!** NIOSH (National Institute for Occupational Safety and Health) says: If *zinc chloride* smoke generating devices are used to generate dense clouds, the smoke should be considered hazardous and participants who enter the smoke should wear a self-contained breathing apparatus (SCBA). Practices like “buddy breathing” should not be conducted in these dense smoke clouds. If individuals experience any breathing difficulties, they should receive medical evaluation as soon as possible. Hurco does not allow the use of zinc chloride smoke bombs with any Power Smoker product.

## Procedures for Smoke Testing

1. The day before the test, notify Police and Fire Department personnel of your activities. There will be no doubt that someone will see your smoke and call for help.
2. Go to each room in the building to be tested and let each occupant know of your activities for the next day.
3. On the day of the test, call Police and Fire Department personnel as a reminder.
4. Go to each room where there are people with health concerns. These people should know to evacuate immediately when seeing smoke or stay out of the building during the test. You can do an inspection for these people before they return to the building.
5. Connect Power Smoker 2 to the cleanout, connect the LiquiSmoke tank and start the engine.
6. Let the engine warm for a few minutes then slowly open the LiquiSmoke valve. Note: The engine needs to run at full throttle. You will control the amount of smoke with the air damper adjustment on the side of the Power Smoker 2 fan housing. For a typical house, this would be the approximately the thickness of a thumbnail.
7. Smoke will start emitting from all leaks and roof vents almost immediately. Start your inspection.
8. Let the Power Smoker 2 run continuously producing smoke until the inspection is complete for optimum results.
9. On completion of your inspection, turn the LiquiSmoke off. Let the engine run for a short time to ensure that all the smoke fluid has been burned out of the Super Jet Smoke Generator.

Note: To increase the life of your Super Jet Smoke Generator, you may occasionally use a good quality brake parts cleaner to help clean any build up in the coil system. Simply disconnect the LiquiSmoke tank from the Power Smoker 2, open the LiquiSmoke valve, and spray a small amount of the brake parts cleaner in the end. The brake parts cleaner will burn out of the Super Jet when the engine is started.

Note: Power Smoker 2 will produce approximately 3 hours of smoke from one gallon of LiquiSmoke. It should take you 5 to 15 minutes to inspect a building. Using a laser light pen can help find small leaks quickly.



Typical set up for Smoke Testing

### Follow these steps when inspecting for plumbing leaks:

1. Move through each room in the building looking for obvious leaks. These leaks will usually be emitting a lot of smoke.
2. If smoke is not immediately visible, it may be because the leak is in the wall panel, under the floor, in a crawl space, above the ceiling or in an attic. To find these leaks, we suggest keeping the light low and using a laser light pen. As the light from the laser light pen passes through the smoke, it becomes very visible. As for leaks in the wall, usually the smoke will go straight up into the attic or above the ceiling. Look in these areas using your laser light pen. This will save tearing out walls looking for the leak.
3. On new plumbing, inspect for leaks prior to the installation of floors, walls and ceilings.
4. Once leaks have been identified and repaired, re-test using the Power Smoker 2.

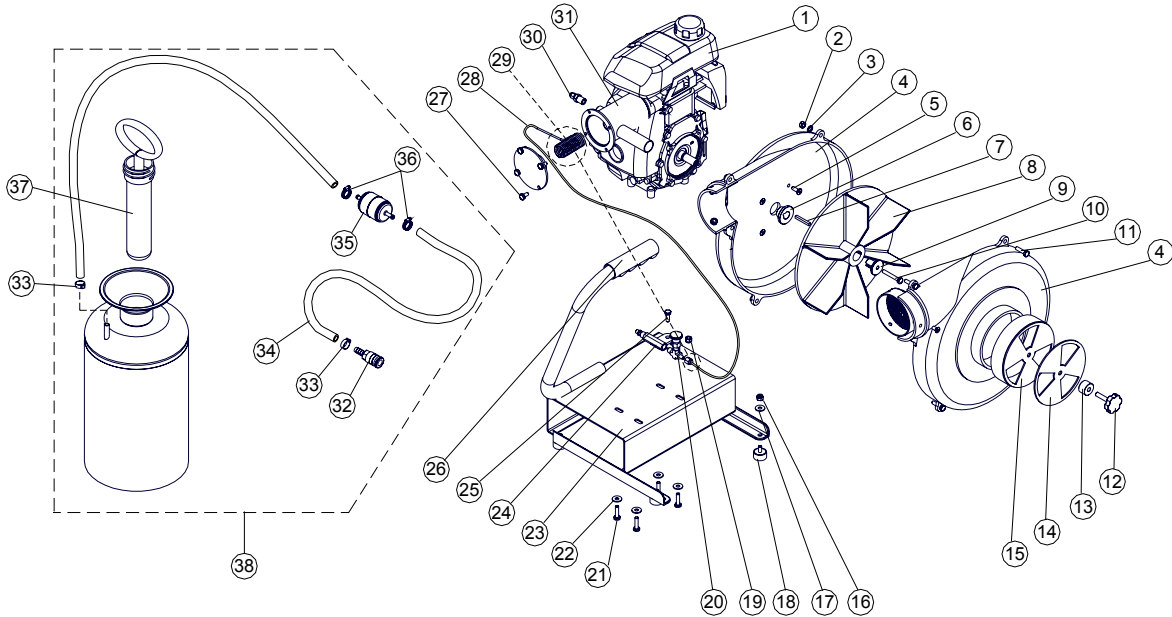
## Identifying leaks and recording data

While you are doing your inspection, you should be aware that plumbing lines can run anywhere so a thorough inspection in all areas of the building is necessary. Sometimes these leaks will emit very small amounts of smoke, barely visible without careful inspection. Look above ceilings, crawl spaces, attics and so on. When you identify a leak, take these steps:

1. Mark the leak with a tag.
2. Video tape or take a digital picture of the leak. These pictures will be useful when you prepare your final report.
3. Take notes while the test is fresh in your mind. Do not wait until you get back to the office.

# Power Smoker 2 Parts Breakdown

This parts breakdown is to help you identify any parts that may need to be replaced or repaired. You should never remove or install the cast aluminum blower. Call Hurco if repairs are required on the Power Smoker 2 blower. **DO NOT ATTEMPT TO MAKE THIS REPAIR ON YOUR OWN.** For help repairing your Power Smoker 2 or ordering parts, call our office at 1-800-888-1436



ITEM	QTY	DESCRIPTION	PT NO.	ITEM	QTY	DESCRIPTION	PT NO.
1	1	2.5 HP HONDA ENGINE	4300-801	20	1	LS NEEDLE VALVE	4300-829
2	5	1/4-20 FHN	901-003	21	4	M6-1.0 X 14 X 12.9 SHCSI	920-205
3	5	1/4" STAR LOCK WASHER	901-023	22	4	1/4" FW	901-020
4	1	* FAN HOUSING ASSEMBLY	4300-803H	23	1	PS2 BASE	4300-806
5	4	1/4-28 X 1" SHCS	901-306	24	1	PS2 LS QUICK CONNECT	4300-332
6	1	FAN BUSHING, FEMALE	4300-807A	25	1	1/4-20 X 3/4" HCS	901-102
7	1	KEYSTOCK	4300-105	26	1	RUBBER HANDLE	4300-310
8	1	FAN	4300-803	27	4	1/4-20 X 1/2" HCS	901-101
9	1	FAN BUSHING, MALE	4300-807	28	1	COPPER COIL	4300-826
10	1	1/4-28 X 1 1/2" SCHS	4300-830	29	1	** LS REPLACEMENT COIL	4300-826A
11	5	1/4-20 X 1" HCS	901-103	30	1	FITTING	4300-827
12	1	KNOB, DAMPER	4300-404	31	1	PS2 LS MUFFLER	4300-810
13	1	DAMPER SPACER	4300-832	32	1	QUICK COUPLER	4300-304
14	1	DAMPER	4300-809	33	2	CRIMP HOSE CLAMP	4300-330
15	1	DAMPER HOUSING	4300-808	34	1	HOSE	4300-302
16	4	1/4" NYLOCK HN	901-001	35	1	IN-LINE FILTER	4300-335
17	4	1/4" FW	901-020	36	2	HOSE CLAMP	4300-334
18	4	RUBBER PAD	4300-811	37	1	PLUNGER (PLUNGER ONLY)	4300-300-13
19	1	1/4" NYLOCK HN	901-001	38	1	*** LS TANK (COMPLETE UNIT)	4300-300A

\*INCLUDES REAR & FRONT HOUSING.

\*\*INCLUDES REPLACEMENT COIL, FITTING, AND FERRELS.

\*\*\*INCLUDES ALL COMPONENTS IN BOXED AREA. 32, 33, 34, 35, 36, AND 37.



# Troubleshooting

**Question:** Why is my Power Smoker 2 spitting out too much LiquiSmoke?

**Answer:** The valve on the Power Smoker 2 that controls the flow of the LiquiSmoke is open too far. This will allow too much fluid to enter the Smoke Generator causing it to cool and not properly atomize the LiquiSmoke. It is advisable to practice with the Power Smoker 2 to determine the exact position of the flow control valve to produce the maximum smoke with little wasted LiquiSmoke prior to use on a job. A small amount of fluid emitting with the smoke is normal.

**Question:** Why isn't my Power Smoker 2 producing dense smoke?

**Answer:** The LiquiSmoke flow control valve is open too far causing the smoke generator to cool. Close valve and allow excess LiquiSmoke to burn off. Now open the valve slowly until you reach maximum smoke generation. This will only take a fraction of a turn on the LiquiSmoke flow control valve.

## Power Smoker 2 Specifications

### **CFM Rating**

The Hurco Power Smoker impellers were tested in accordance with AMCA (Air Movement and Control Association) standards.

Power Smoker 2 – up to 700 CFM @ 8.0 static pressure

### **Engine**

Honda GXH50 2.1 HP engine, Air-cooled, 4-Stroke, OHV, single cylinder.

*Note: Refer to engine manufactures manual for warranty information and maintenance instructions.*

### **Included Equipment**

6 feet of 4 inch flexible duct  
LiquiSmoke pressure tank

### **LiquiSmoke**

Approximately 3 hours of smoke delivery out of one gallon of LiquiSmoke.

### **Limited Warranty**

When used in accordance with instructions, HURCO Technologies, Inc. will replace to the original purchasers, free of charge, any part or parts of the Power Smoker 2 unit, excluding the engine, found to be defective in material or workmanship or both; this is the exclusive remedy. All transportation charges on parts submitted for replacement under this Warranty must be borne by the purchaser. The engine is warranted as outlined by the engine manufacturer's separate, limited warranty only. This warranty does not cover damage or loss to the Power Smoker 2 unit from operating negligence, or due to accident or other casualty. **THERE IS NO OTHER EXPRESS WARRANTY OR IMPLIED WARRANTIES. THIS WARRANTY IS LIMITED TO A PERIOD OF ONE YEAR FROM THE DATE OF PURCHASE AND TO THE EXTENT PERMITTED BY APPLICABLE LAW, ANY AND ALL IMPLIED WARRANTIES, INCLUDING THOSE OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE HEREBY EXCLUDED, TO THE EXTENT PERMITTED BY LAW. IN NO EVENT SHALL WARRANTOR BE LIABLE FOR DIRECT, INDIRECT, INCIDENTAL AND CONSEQUENTIAL DAMAGES RESULTING FROM ANY DEFECT IN THE GOODS, TO THE EXTENT SUCH AVOIDANCE IS PERMITTED BY APPLICABLE LAW.**



1-800-888-1436 • [gethurco.com](http://gethurco.com) • [info@gethurco.com](mailto:info@gethurco.com)

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