

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.



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; Per the canisters manufacturer: With pump facing away, turn locked handle counterclockwise until air begins to escape. Stop turning handle when you hear air escaping. Stay away from the sprayer until all air has escaped. Additional recommendation: Place a rag over the handle and top of canister when releasing the pressure to help avoid spraying fluid that may escape with the pressurized air. **Never open the 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 ¼ 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 use 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.

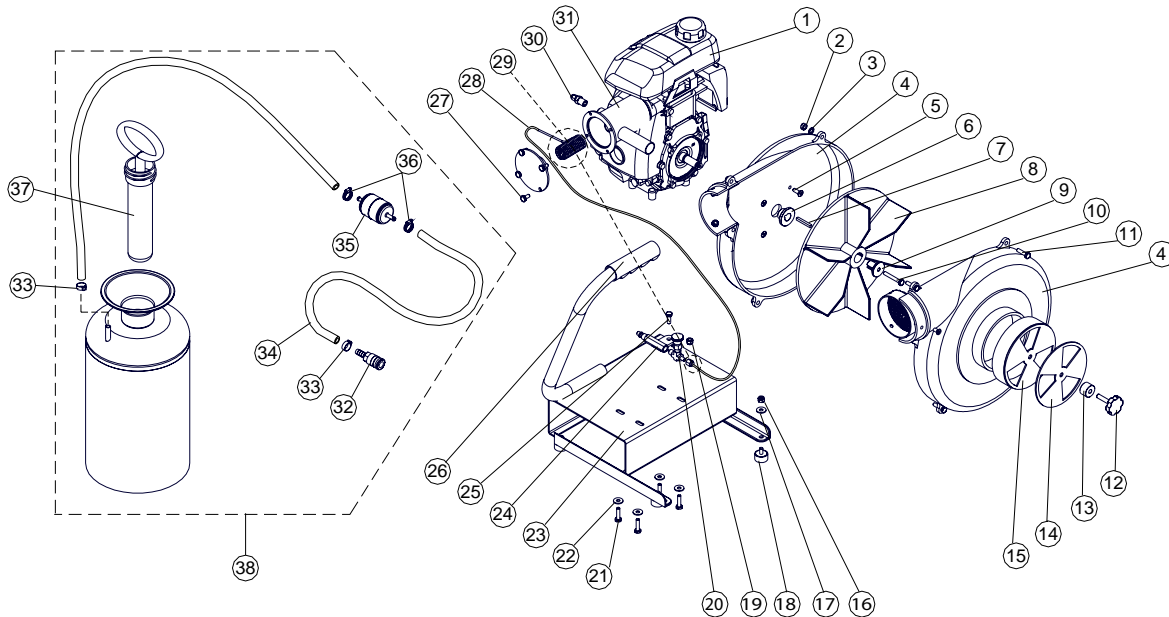
Identifying leaks and recording data

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 20 X 12.9 SHCSI	920-207
3		WASHER INCLUDED IN #2		22	4	1/4 FLATWASHER	901-020
4	1	PS2 FAN HOUSING COMPLETE	4300-803	23	1	PS2 BASE	4300-806
5	4	1/4-28 X 3/4" 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	BROWNING 7/8 KEYSTOCK	4300-105	26	1	YELLOW GRIP HANDLE	4200-310
8	1	PS2 REPLACEMENT FAN	4300-803F	27	4	1/4-20 X 1/2" HCS	901-101
9	1	FAN BUSHING, MALE	4300-807	28	1	COPPER COIL **	4300-810CC
10	1	1/4-28 X 1 1/2" SCHS	901-305	29	1	1/8 SMOKER FERRULE **	4300-847
11	5	1/4-20 X 1" HCS	901-103	30	1	COIL COUPLER FITTING**	4300-827
12	1	KNOB, DAMPER	4300-404	31	1	PS2 LS MUFFLER	4300-810
13	1	DAMPER SPACER 5/16	4300-832	32	1	FEMALE QUICK COUPLER	4300-304
14	1	DAMPER	4300-809	33	2	HOSE CLAMP	4300-330
15	1	DAMPER HOUSING	4300-808	34	1	3/8 FUEL LINE	4300-300-16
16	4	1/4-20 NYLOCK	901-001	35	1	IN-LINE FILTER	4300-335
17	4	WASHER 1/4"	901-020	36	2	HOSE CLAMP	4300-330
18	4	RUBBER VIBRATION PAD	4300-811	37	1	PLUNGER (PLUNGER ONLY)	SEE BELOW
19	1	1/4"-20 NYLOCK HN	901-001	38	1	LS TANK (COMPLETE UNIT) ***	4300-300A
				37A		PLUNGER FOR YELLOW TANK	4300-300-13
				37B		PLUNGER FOR BLACK TANK	4300-300-14
						FUEL LINE W/IN-LINE FILTER****	4300-300-16A
						Flex Duct hose (Black & Yellow)	4300-823
				2		4" hose clamp for flex hose	990-413

**INCLUDES REPLACEMENT COIL, FITTING, AND FERRELS. 28, 29 & 30
 ***INCLUDES ALL COMPONENTS IN BOXED AREA. 32, 33, 34, 35, 36, & 37
 ****FUEL LINE W/IN-LINE FILTER, HOSE CLAMPS & COUPLER. 32, 33, 34, 35, 36
 PLUNGER FOR PLASTIC TANK IS NO LONGER AVAILABLE

Replacing Copper Coil

Step 1. Remove the muffler from the machine by unscrewing the 4 bolts. Remove the coupler from the coil, gently bend the end into an "L" shape.

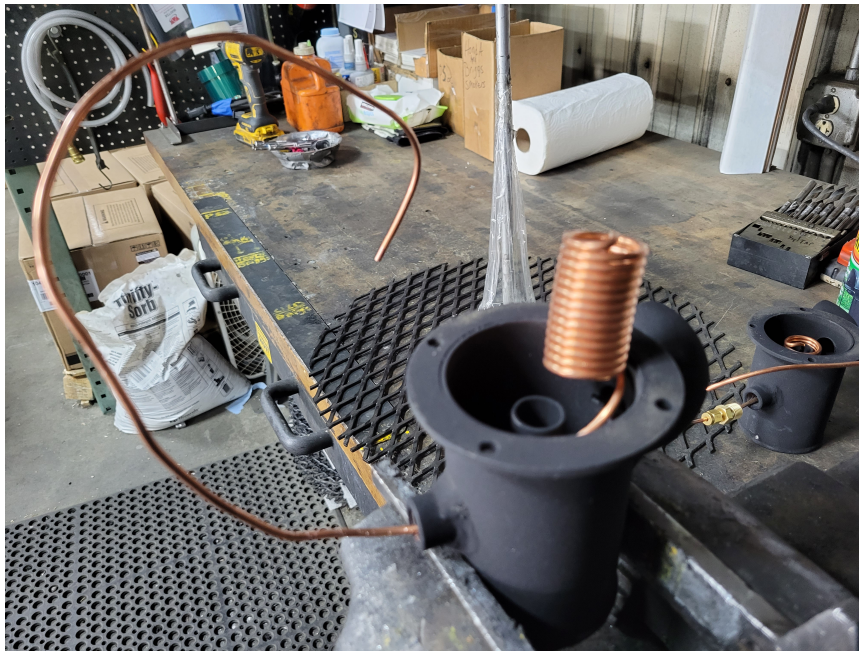


Step 2. Feed the "L" through the small tube opposite the curved downspout. *Push the coil down as you're pulling the coil straight through, scraping the coil across the treads could damage the coil. The coil will start to curve upwards as you pull it through.

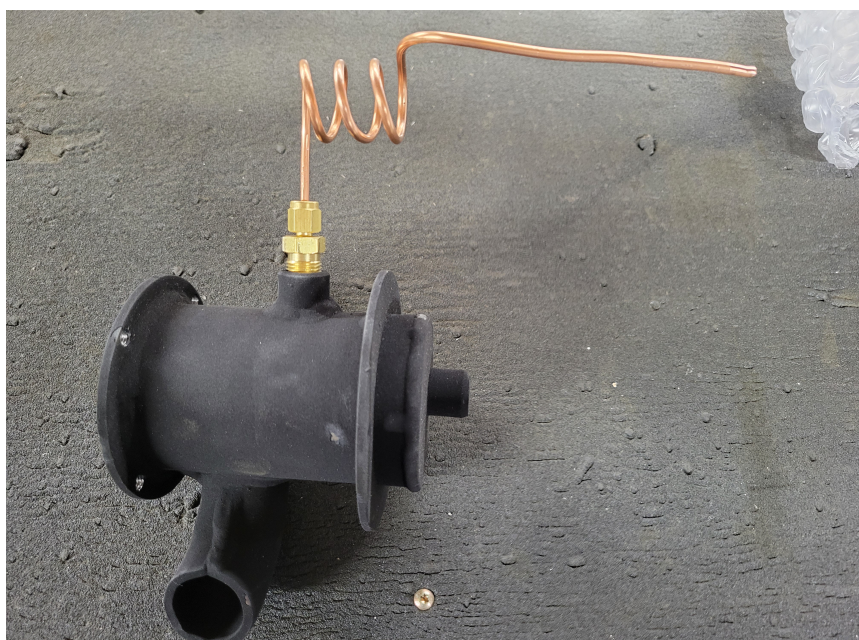


Step 3. Once the coil is mostly through the muffler, bend the coiled section up just a touch so it will fit over the tube in the center. Push the coil down over the tube.

If you have an SMK18/24H (Honda) or SMK18/24 (Briggs) with a serial number after 11/01/17 move to step 4. If you have a PS2 or SMK18/24 (Briggs) with a serial before 11/01/17 you do not need to do step 4. Replace the coupler then attach the other end to the needle valve.



Step 4. Replace the coupler and coil or curl the extra coil, this is to keep the copper from cracking due to vibration, then attach the other end to the needle valve.



Hurco Smoke testing with LiquiSmoke FAQs

Q. How much LiquiSmoke do I need?

A. On average a single gallon of LiquiSmoke will last approximately 3 hours of actual machine run time or 7200 feet. We calculate this assuming an 800 ft test taking 20 minutes of machine run time or a 3-manhole test.

Q. During the smoke test, smoke was found in a nearby home. What should I tell this person?

A. Hurco LiquiSmoke in smoke form is completely safe and non-toxic. There are NO harmful chemicals in this product. If you are seeing smoke in your home or business, you should be concerned with what invisible potentially hazardous sewer gases are also in your home. Schedule a test as soon as possible for the homeowner or business. If you would like a copy of our smoke test results or SDS send a request to info@hurcotech.com or call us at 800-888-1436.

Q. During a smoke test some liquid spilled, will it stain?

A. In the liquid form it can stain. To clean use a Dawn and warm water solution and some scrubbing and it should come clean. On tough stains a pressure washer with the soap solution can be used, test the pressure washer on an inconspicuous area first. Hurco LiquiSmoke in smoke form will not stain furniture or carpets.

Q. Will the smoke set off smoke alarms?

A. Yes, it can set off smoke alarms in large concentrations. If you are setting off alarms, you likely have a major leak. In this instance turn off the machine, open the windows and doors and air out the room. Fix the leak before continuing the smoke test in this area.

Q. Where does the carbon monoxide from the engine go?

A. The PS2 is built to expel the carbon monoxide through the cleanout or sewer line rather than the room being used in. When using the original PowerSmoker (over a manhole) most of the carbon monoxide will come out the engine and disperse. All of the byproducts from the engine are factored into the smoke test results mentioned above.

Q. Can scents or colors be added to the smoke?

A. No. Adding scents or colors will change the chemical composition. This may cause the product to become hazardous or not burn correctly, which will waste the product and cost you money.

Q. Can LiquiSmoke be used in pyrotechnics?

A. The smoke generated is far more dense than pyrotechnic smoke and will not dissipate quickly, you will not be able to see through it. We do not recommend using our product for pyrotechnics. If you choose to do so, you do it at your own risk.

Q. Should I plug the vents, clean outs ect... when performing a smoke test in a building using the PowerSmoker2 (PS2) or over a manhole using the Ripcord PowerSmoker (SMK)?

A. No. Both PowerSmokers force the smoke through the lines. Plugging up the lines will change the natural air movement which can result in an unreliable test. If the air isn't moving as it normally would, you may not find the leak causing the problem. Additionally, since the smoke is being forced through the lines you risk having smoke (and the air it is traveling with) pushed up toilets, drains and traps. Typically, you would only plug the lines when you do not want any smoke moving into a certain area.

Q. I am getting a lot of LiquiSmoke oil coming out of the hose or from the muffler, what might be causing this?

A. Most of the time the reason for this is that the needle valve is open too far. You want to open the needle valve only 1/8 to 1/4 of an inch. You'll want to open the damper on the side the thickness of your thumb nail to start. We always suggest you play around with the machine before the actual test to get used to it and find that sweet spot for the needle valve and damper.

Q. I think there may be a plug in the copper coil, what can I do?

A. After each test is complete you should turn off the LiquiSmoke at the needle valve but continue to run the machine to burn up any left-over smoke oil in the copper coil and muffler. Once complete attach a standard air compressor to the quick connect (3/8") and blow out the coil. For stubborn clogs you can spray carb or brake cleaner into the quick connect then blow it out with the air compressor. This should be done after every few tests and when you're done for the season.

Q. The copper coil is broken, how do I get a replacement?

A. You can contact your local sewer or plumbing related dealer or Hurco directly at 800-888-1436. To be sure we get you the correct coil, we'll need to know if you have a PS2, SMK18/24 (Briggs) or SMK18/24H (Honda). If you have a Briggs locate the serial plate on the outer yellow ring, we'll need that to determine the coil needed.

Q. The plunger for my tank needs to be replaced, how do I get a replacement?

A. You can contact your local sewer or plumbing related dealer or Hurco directly at 800-888-1436. To be sure we get you the correct plunger, we'll need to know if you have a blank metal tank or yellow metal tank. Unfortunately, the plungers for the old plastic tanks are no longer available.

Q. There isn't a relief valve on my pressure tank, how do I release the pressure?

A. Per the tank manufacture - Releasing pressure quickly can cause any remaining fluid to spray up. To help avoid this, you can cover the plunger handle and canister with a towel when opening. Lock handle. With pump facing away, slowly turn the handle counterclockwise. When you start hearing air escaping, stop turning the handle and allow the rest of the air to be released.

Q. How should I clean the pressure tank?

A. Rinse tank with water. Remove plunger assembly and store upside down. Plunger can be oiled by dropping 10-12 drops of 3-in-1 multi-purpose oil down the plunger shaft.

Q. What type of oil and fuel should be used?

A. We use 10W-30 oil and non-ethanol fuel (not mixed).

Q. How much oil should I put in?

A. SMK Briggs - 15 ounces or just below the neck bracket
 SMK Honda - 10 ounces or at the bottom thread
 PS2 Honda - 4.75 ounces maximum of 5 ounces

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 or about 7200 ft per gallon.

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.**

NOTES



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