ACTIVE SAMPLE CONDITIONER

Accessory for PCA® 400

Combustion & Emissions

P/N: 0024-9601 | June 2018 Revision 1

User Manual

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1. Overview

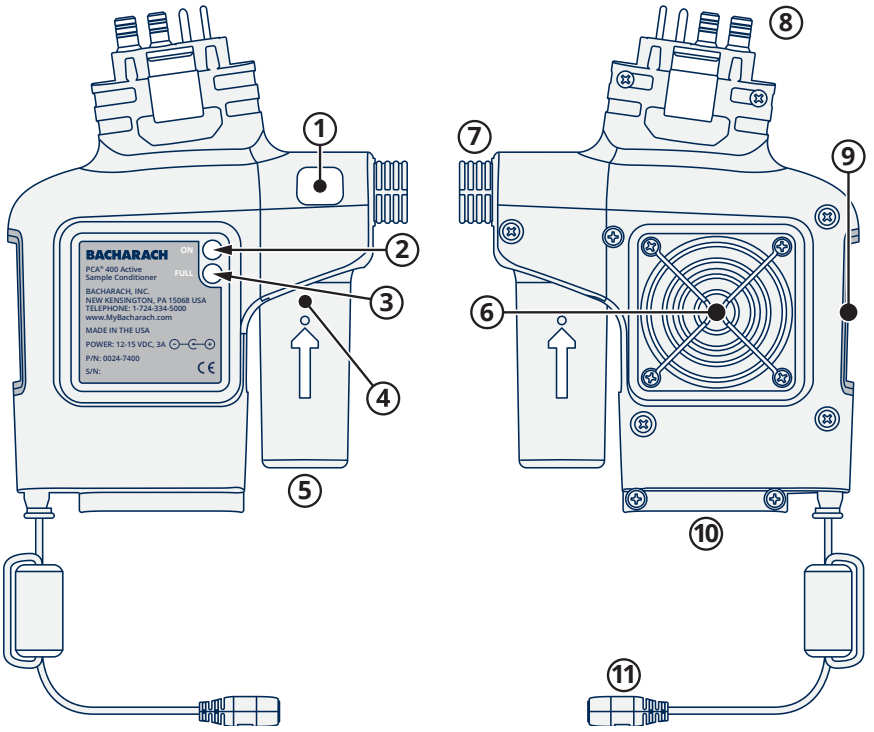
1.1 General Information

Bacharach's active sample conditioner for the PCA® 400 removes water vapor from the stack gas sample, thus preventing the formation of water droplets inside the probe hose. If water droplets were to form inside the hose, a portion of the gas sample could be absorbed by the water, thus resulting in lower than actual readings of NO_2 and or SO_2.

Water vapor is removed from the flue-gas sample by passing the sample through a thermoelectric (Peltier) cooler where the sample is chilled, causing the water vapor in the gas sample to be removed from the sample.

The water extracted from the gas sample is pumped out of the cooler and into a water catch pot. The dry, conditioned flue-gas sample is then passed through to the PCA® 400 for analysis.

1.2 Components



#	Item	Description
1	Filter and Inspection Window	In-line particulate filter. Visible through the inspection window. Change by removing the filter cap.
2	Green “ON” LED	Glows steady when device is ON and running normally. Also indicates that the thermoelectric cooler temperature is within the 5°C operating window.
3	Red “FULL” LED and Buzzer	Indicates one of the following conditions: 1. catch pot is full of water and should be emptied 2. fan has stopped working. Buzzer sounds briefly at power up.
4	Float Switch	Monitors the water level, triggers the red LED and buzzer when the catch pot needs to be emptied.
5	Catch Pot	Holds water from the stack gas. Bayonet mount for rapid removal with a simple twist.
6	Fan Inlet	Ambient air input for sample cooling
7	Filter Cap	Remove to access and replace filter.
8	Probe Connector	Keyed connector for PCA® 400 probe
9	Exhaust Duct	Main exhaust duct (additional exhaust duct behind catch pot)
10	Sample Tube Connector	Keyed connector for PCA® 400 tubing
11	Power Connector	Connects to wall adapter (included) for power

1.3 Features

- Built-in temperature controller, accurate to 1°C
- Quickly connects between the PCA® 400 probe handle and hose with keyed connectors
- Green operation LED
- Red LED when catch pot full
- Buzzer (operates with red LED)
- Light weight
- Built-in particulate filter with inspection window
- Self-contained design
- Built-in water catch pot
- Line-powered universal AC input
- Power entry cord
- Direct temperature and draft signal pass-through to the PCA® 400

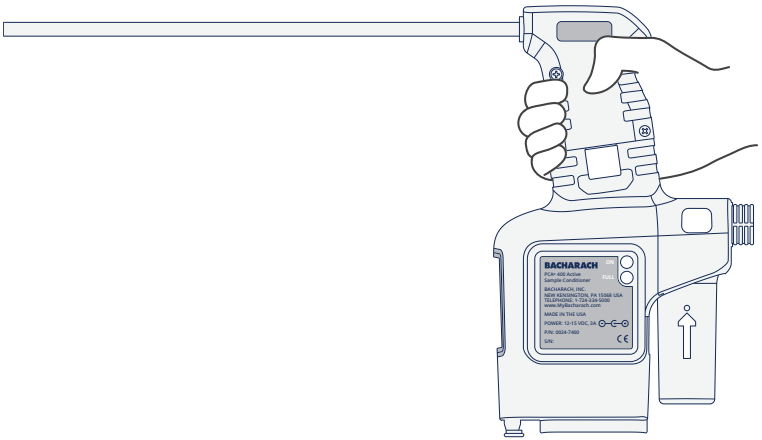
1.4 Precautions

To ensure the proper operation and prevent the possibility of voiding the warranty, be sure to observe the following precautions.

IMPORTANT: Avoid dirty or dusty locations, or those with excessive heat or humidity.

IMPORTANT: Use only original equipment components with this device.

IMPORTANT: During normal operation, the probe should be kept level with the handle facing down as depicted below.



1.5 Technical Specifications

Specification	Description
Dimensions W×L×H	3.2 in × 6.0 in × 6.0 in (81 mm × 152 mm × 152 mm)
Weight (approx.)	10 oz (284 g)
Control Temperature	41°F nominal cooler temperature (5°C)
Catch Pot Capacity	35 ml
Power Supply	AC/DC adapter, 100-264 VAC input, 15V, 90W DC output

Specification	Description
Storage Temperature	14°F to 122°F (-10°C to 50°C)
Storage Humidity	10% – 90% RH, non-condensing
Operating Temperature	41°F to 104°F (5°C to 40°C)
Operating Humidity	10% to 90% RH, non-condensing

2. Setup

STEP 1 | Inspect Device

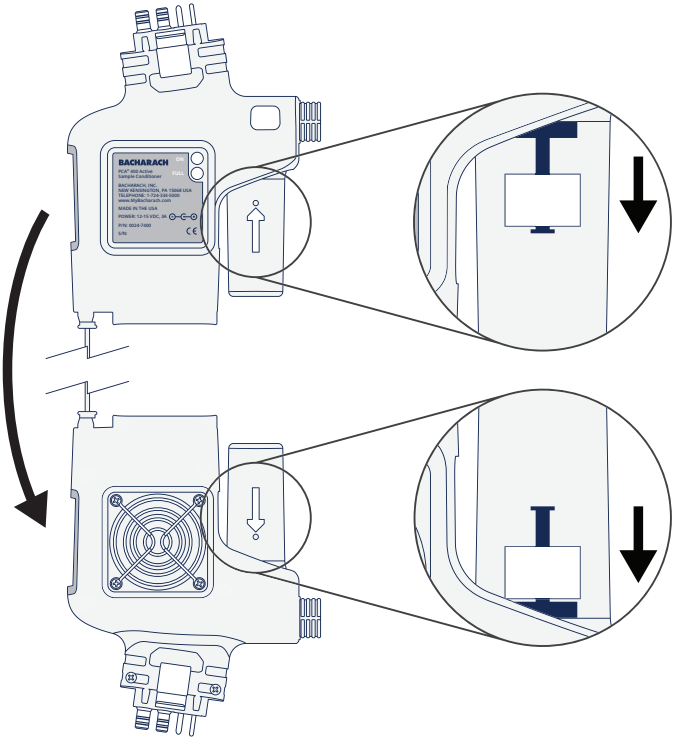
Inspect the sample conditioner and power cord for signs of damage.

STEP 2 | Remove & Clean Catch Pot

Inspect the catch pot for dirt or water. Remove the catch pot by twisting counterclockwise ⅛ turn to empty or clean. (Be certain to account for the sealing o-ring when removing catch pot. When reattaching the catch pot, place the o-ring in its groove and carefully reinstall.)

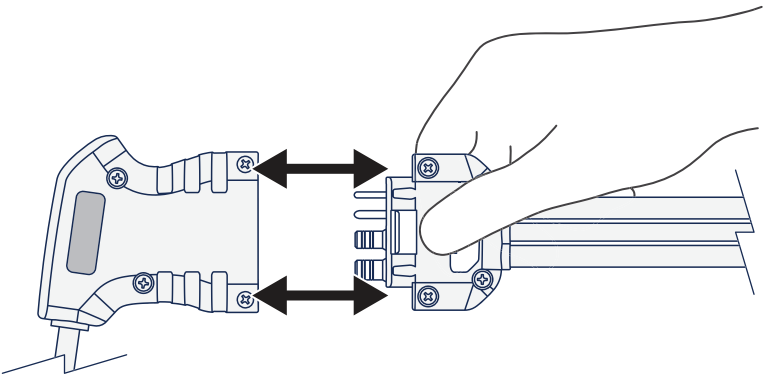
STEP 3 | Inspect Float

While observing the white float through the catch pot, invert the device. Ensure the float moves freely up and down.



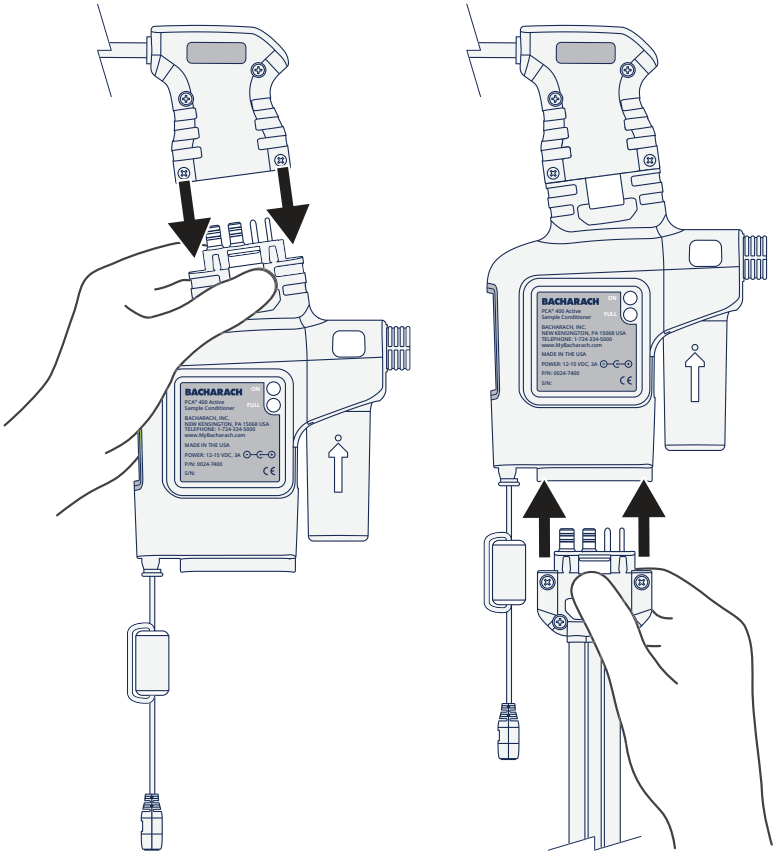
STEP 4 | Disconnect Probe Hose Set

If necessary, disconnect the probe hose set from the probe by squeezing the release tab.



STEP 5 | Assemble Sample Conditioner

Insert the sample conditioner into the probe handle, engaging until fully seated. Ensure the device is latched in place. Then connect the probe hose set to the bottom of the sample conditioner.



STEP 6 | Plug-in Electric Supply

Connect the power cord to the device and plug into electric outlet.

3. Operation

3.1 Normal Function

When ready to conduct a combustion efficiency test, plug in the power supply of the sample conditioner. You should see and hear the cooling fan and see the green “ON” LED turn on within 20 seconds.

Set up and configure the combustion analyzer as described in its instruction manual and then insert the probe into the flue stack and begin testing.

During the combustion test, the condensed water vapor from the exhaust gas will accumulate inside the catch pot. If the red “FULL” LED lights and the buzzer sounds, it typically indicates that the catch pot requires emptying.

CAUTION: The probe is hot. In the following step, be sure to allow the probe sufficient time to cool before handling.

At the conclusion of the combustion test:

1. remove the probe from the stack
2. unplug the sample conditioner’s power supply
3. disassemble the probe as required.

IMPORTANT: Under no circumstances should water be left in the catch pot when storing the sample conditioner. Remove the catch pot and wipe off the inside with a clean absorbent cloth at the conclusion of all testing.

3.2 Catch Pot Full

The catch pot holds 35ml of liquid water. The sample conditioner may therefore be expected to operate for several hours before requiring the catch pot to be emptied when sampling methane stack gases.

The red “FULL” LED will light and the buzzer will sound if the float switch is raised by condensate.

To remove the catch pot, simply grasp the body and twist counterclockwise ⅛ turn to release the bayonet. Pull the catch pot straight down and out of the sample conditioner, taking care not to spill liquid or pull the hoses.

IMPORTANT: Care should be taken to account for the o-ring throughout the process of removing & emptying the catch pot. Ensure that the o-ring is properly seated in its groove on the top edge of the catch pot when re-installing the catch pot in the sample conditioner.

Clean the inside of the catch pot as required with an absorbent cloth. Insert and twist the catch pot ⅛ turn to re-install the catch pot to the main body of the sample conditioner. The arrows on opposite sides of the pot should align with the corresponding marks on either side of the sample conditioner.

3.3 Fault Conditions and Remedies

The sample conditioner operates automatically and without user intervention. The only fault conditions that the user may diagnose are when the catch pot is full, or the fan is no longer operating. Both of these conditions will make the red "FULL" LED light illuminate and the buzzer sound.

The green "ON" LED indicates that the cooling device is operating within its temperature window (around 5°C). If the green "ON" LED does not light while power is applied, even though the fan is operating, check the following.

Possible Cause	Recommended Actions
Heat Sink is Dirty or Damaged	Visually inspect the heat sink fins for dirt or damage by looking into the exhaust ducts. If the fins are dirty they may be cleaned with either a pipe cleaner (carefully inserted between the rows of fins) or by low pressure shop air (or "canned air dusters").
Improper Ambient Conditions	Ensure the ambient temperature conditions around the sample conditioner are within the operating range listed in Section 1.5. The temperature next to hot equipment can be significantly higher than the prevailing ambient temperatures. Provide additional cooling air as needed into the work area if the surrounding temperatures are too high.
Inlet Filter Is Dirty	Low flow through the device may be caused by a dirty or contaminated inlet filter. Inspect the filter by observing its color through the inspection window and replace as necessary.

IMPORTANT: The catch pot o-ring forms part of the sealed gas sample path, and must be leak free when performing measurements. If the o-ring is missing or damaged, the PCA® 400 will display a higher than normal oxygen reading. The other gas readings may also be offset. If the oxygen value increases, it indicates the catch pot o-ring is likely dirty, damaged, or missing. Correct this condition to ensure accurate readings.

4. Maintenance

4.1 Catch Pot

IMPORTANT: Never leave water in the catch pot when storing the sample conditioner. Remove the catch pot and dry the inside with a clean absorbent cloth after testing is finished.

Before storing the sample conditioner remove the catch pot and remove all water and dirt using a clean absorbent cloth. Gently wipe the float switch making sure not to pull the float off or otherwise damage the part. Re-install the catch pot, ensuring that the o-ring is properly seated in its groove on the top edge of the catch pot.

4.2 Cleaning the Sample Conditioner

External surfaces of the sample conditioner may be kept clean by simply wiping with a damp cloth. Do not use any solvents that may attack the plastic case.

IMPORTANT: Be sure that the inside surfaces are kept dry at all times.

4.3 Cleaning the Heat Sink Fins

To maintain proper performance, it is recommended that the heat sink fins be visually inspected for dirt or contamination after each use. The fins may be cleaned with either low pressure dry compressed air or canned air dusters. If the fins still require cleaning after this step, isopropyl alcohol may be used with either pipe cleaners or cotton swabs.

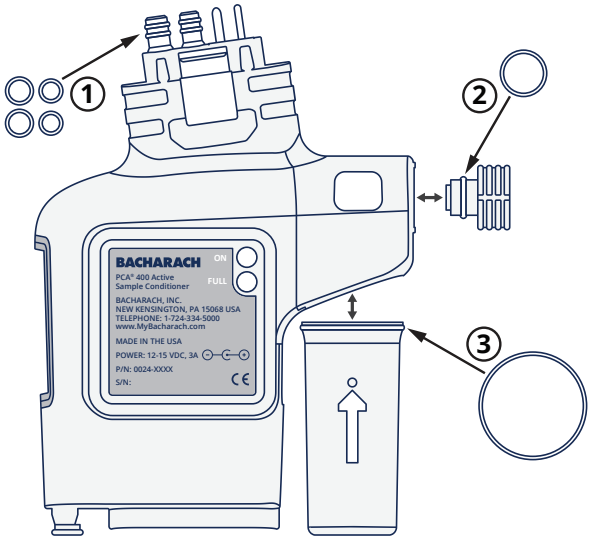
IMPORTANT: Do not insert anything into the fan or the fins that could break the parts. Do not make the fan spin by blowing air through it as bearing damage may occur.

4.4 Cleaning the Inlet Filter Housing

Remove the filter cap and filters and wipe the inside surfaces with a clean absorbent cloth. To prevent hazing of the clear plastic, do not use any cleaners or chemicals when cleaning.

4.5 O-Ring Replacement

The inlet filter cap, catch pot, and gas sample ports all use o-rings for sealing. Each is available for replacement (see full list of spare parts in Section 5).



4.6 Inlet Filter Replacement

The inlet filters may be replaced with Bacharach filter P/N 0007-1658 (sold in bags of 30 pieces).

IMPORTANT: Ensure the combustion analyzer is in hold mode whenever changing the in-line particulate filters. Changing the filters while sampling gas increases the chance that contamination bypasses the filter and enters the cooler. This may lead to unexpected results, low readings, or other undesirable effects.

IMPORTANT: When the probe is in the stack and connected to the probe handle, keep the sample conditioner and probe level (i.e., *parallel* to the ground).

4.7 Disposal

At the end of its working life the sample conditioner should be disposed of in accordance with the Waste Electrical and Electronic Equipment (WEEE) Regulations, if in use within the EU, and in accordance with national requirements in other countries.

5. Accessories & Spare Parts

P/N	Description
0007-1658	Inlet Filter, 30 Pieces
0024-1753	Inlet Filter Cap
0019-3345	Catch Pot
0024-1763	Power Supply, 100-264 VAC, 15 VDC, 90 W
0024-1787	Replacement O-ring Kit

IMPORTANT: Use only original equipment components with this device.

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www.mybacharach.com

For more information about the PCA 400 and other Bacharach products scan here.

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