



Intelli-Pur™

Installation Instructions & Maintenance Manual

Document Part Number	<u>I-010</u>
Document Edition Number	<u>2.0</u>
Edition Release Date	<u>September 27, 2010</u>

Technical Support Call Toll Free (866) OILPURE

Technologies For a Greener Future

OPS prides itself on being a green company and is committed to protecting the environment by providing high-quality "green" products, and technologies for a wide range of industrial and commercial applications. Our goal is to aggressively reduce consumption of petroleum and synthetic based lubricants and fluids.

Copyright Notice:

Copyright © 2009 Oil Purification Systems, Inc. All Rights Reserved. Intelli-Pur is a trademark of Oil Purification Systems, Inc. Intelli-Pur Patented 7,244,353 and 6,287,455. Patents Pending in the United States and other countries. Other trademarks and trade names that may be used in this document to refer to either entities claiming the marks and names or their products. OPS disclaims any proprietary interest in trademarks and trade names; such marks and names are owned by their respective holders.

Table of Contents

Installation

Precautions & Notes for Hose Connections	3
Before Installing This System.....	3
Major Components.....	4
Section 1 – Locate the Supply & Return Ports	5
Section 2 – Mounting the System	5
Section 3 – Installing Fittings and Connecting Hoses	6
Section 4 – Electrical Connections	7
Section 5 – Setting the Flow	8
Section 6 – Operational Verification	10

Maintenance

Section 7 – Service Parts.....	11
Section 8 – Replacing the Oil Filter Element	11
Section 9 - Taking an Oil Sample	12
Section 10 – Sample Submission and Registration	12
Section 11 – Diagnostics	15
Section 12 – Troubleshooting	16
Warranty	17

Installation





Safety Precautions Before Beginning Work

- Work in a clean, well-lighted area.
- Wear proper safety apparel.
- Ensure 110 VAC 60Hz supply is available.
- Ensure proper welding equipment is available.

Notes for all Hose Connections

- Ensure that all hoses are of adequate length to prevent kinking.
- Route all hoses away from extremely hot parts.
- Route all hoses away from moving parts.
- Use tie straps to secure hoses in place.
- Leave a slight amount of slack in the hoses to allow for equipment vibration.
- Use the shortest length of hose that will meet these guidelines.
- Use two wrenches when tightening fittings to ensure secure connections.

Before Installing This System

- For optimal performance, OPS recommends changing the fluids and filters at the time of installation.
-  Be sure to handle used fluids and filters in compliance with all applicable laws. This usually includes making provisions for recycling.
-  Always wear proper personal protection equipment such as oil-resistant gloves and safety glasses when handling oil products.

Technical Support Call Toll Free (866) OILPURE

Intelli-Pur™ On-Board Fluid Cleaning System

Major Components



1. Pressure Gauge
2. Sampling Valve
3. Reservoir
4. Filter (4)
5. Filter Gauge (4)

6. Flow Control Valve
7. Electronic Control Module
8. Hour Meter
9. Operating Light (Green indicator light)

Section 1 – Locate the Supply and Return Ports on Equipment

Supply Port

This port supplies the Intelli-Pur System with pressurized fluid through a ½” supply line. This port can be created by adding a tee into an existing internal or external circulating system. It is also recommended that a shut-off valve be installed at this location to stop flow to the system for servicing. Pressure at this port can not exceed 125 psi.

Return Port

This port is used to return cleaned fluid by gravity from the Intelli-Pur System through a 1-1/8” return line. This port can be created by adding a tee below an existing breather on the reservoir or by using an existing port into the reservoir. (Note: this port can not be tee'd into an existing return line)

Section 2 – Mounting the System

Select a location

Selecting the optimal mounting location is key to insuring that the Intelli-Pur System operates properly.

Follow these guidelines when determining a final mounting location, which should:

- Allow the unit when mounted to sit level and plumb
- Provide easy access to the filters and sampling valve
- Keep the exit port (on the back of the reservoir) at least 6” higher than the return port on the equipment

If you're unable to determine a proper mounting location, call OPS Technical Services at 1-866-OIL-PURE Ext. 4 for support.

Mounting the unit

Four (4) angle brackets are provided to mount the Intelli-Pur to the equipment. Using the system as a template:

- Position the system where it will be situated on the equipment
- Locate the positions of the brackets at each corner of the steel frame
- Mark the locations on the equipment
- Weld or bolt the brackets to the equipment

- Attach the system to the brackets

Section 3 – Installing Fittings and Connecting Hoses

After a suitable location for the Intelli-Pur has been determined and the unit installed, proceed with hose fabrication and installation.

Hose Specifications (Supplied):

Supply line:

- 1/2" reinforced nitrile hose with an operating temperature of -40°F to 212°F designed to be used with field installable fittings

Return line:

- 1-1/8" reinforced nitrile hose with an operating temperature of -40°F to 212°F designed to be used with field installable fittings

Note: If using pre-fabricated hose assemblies, #8 JIC female swivel connections are required at each end of the 1/2" hose assembly and #20 JIC female swivel connections are required at each end of the 1-1/8" hose assembly.

Connecting to the Supply Line

Connecting to the selected supply source may require the insertion of a tee, replacing a plug with an adapter, or another combination of fittings that will provide a #8 JIC male termination for connecting the supply line. A #8 JIC termination is also provided on the Intelli-Pur unit for the opposite end of the supply.

Once the proper fittings have been installed, measure the distance between them by running a tape measure along the intended route for the hose. Add a few inches to the measured length to accommodate vibration, movement, and hose-bend radius. Install the fittings provided (see appendix A for fitting installation instructions) to each end of the hose and attach the hose assembly to the respective JIC fittings. Use cable ties to secure the lines and to minimize chafing and wear.

Connecting the Oil Return Line

Connecting to the selected return location may require the insertion of a tee, replacing a plug with an adapter, or another combination of fittings that will provide a #20 JIC male

termination for connecting the supply line. A #20 JIC termination is also provided on the Intelli-Pur unit for the opposite end of the supply.

Once the proper fittings have been installed, measure the distance between them by running a tape measure along the intended route for the hose. Add a few inches to the measured length to accommodate vibration, movement, and hose-bend radius. Install the fittings provided (see appendix A for fitting installation instructions) to each end of the hose and attach the hose assembly to the respective JIC fittings. Use cable ties to secure the lines and to minimize chafing and wear.

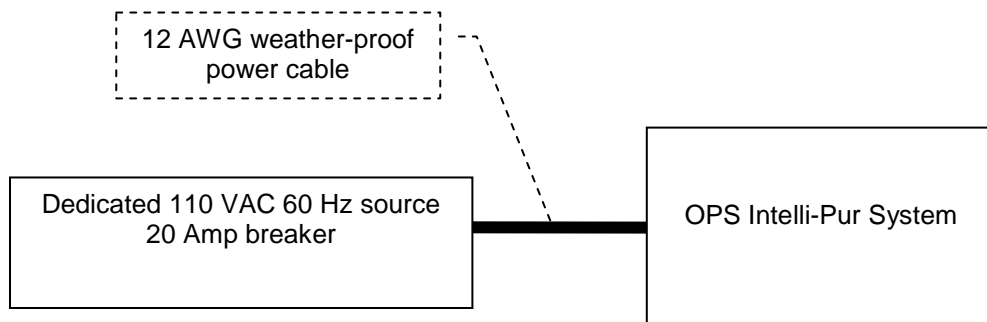
Because this connection is gravity fed, you must:

- Choose a location that will provide the most direct route to the return port.
- Insure the entire length of the hose slopes downward.
- Route the hose to eliminate any kinks or sharp bends.
- Follow all rules applicable to all hoses.

Section 4 – Electrical Connection

Selecting an electrical source

A dedicated 110 VAC 60 Hz power source with a 20 amp breaker is recommended.

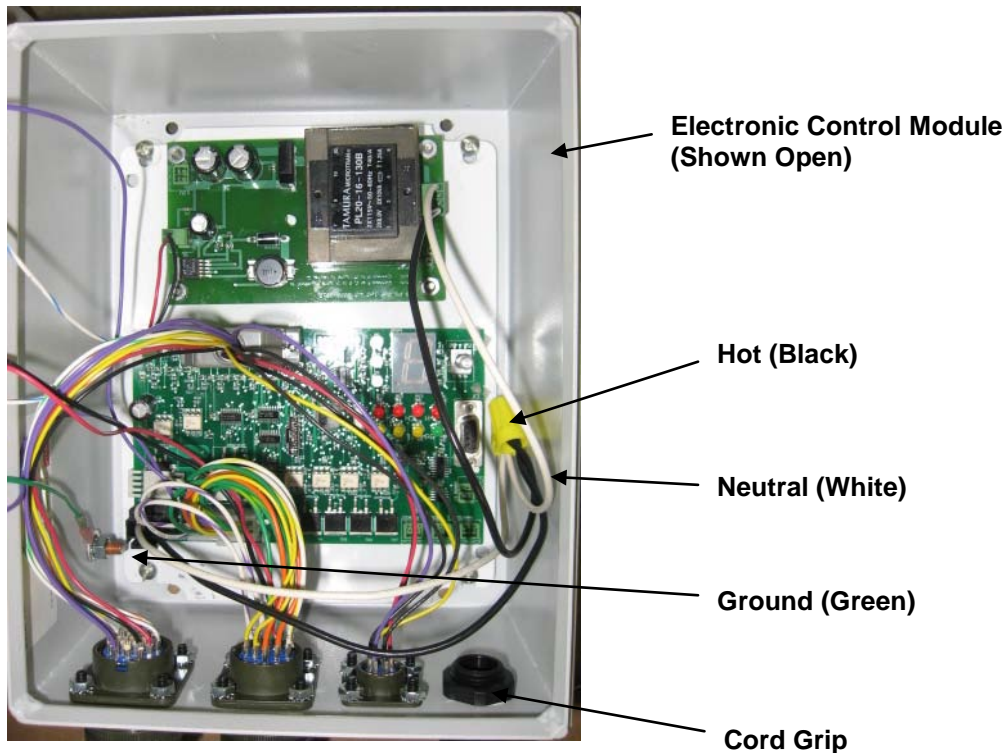


Attach Power Cable

Use a 12 AWG power cable that is no more than 50 feet to supply power to the control module.

- Insert cable into control module through the cord grip located at the bottom of the electrical enclosure
- Connect hot (black) wire and neutral (white) to existing black and white wires in the control module using wire nuts and electrical tape

- Connect ground (green) wire to ground lug in the enclosure



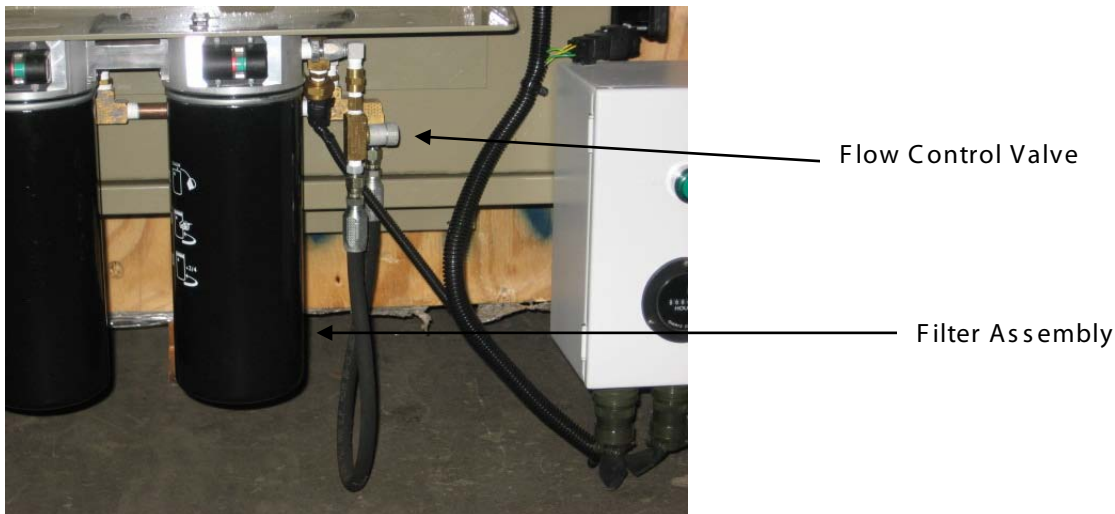
Section 5 – Setting the Flow

After installing the Intelli-Pur; it will be necessary to set the flow either at each filter assembly or in front of the first filter (as seen on page 4 item 6) at approximately 2.5 – 3.0 gallons per hour (5.5 – 6.5 ounces/minute). Ideally this process should be completed after the fluid has reached its normal operating temperature and pressure. Open shut-off to allow flow to system and verify pressure at unit (pressure should be between 20 and 125 psi).

The following procedure will be repeated at each filter assembly:

- Insure that the flow control valve is fully closed
- Place a drip pan below the valve
- Disconnect the transfer hose from the valve assembly

- Place a graduate container below the valve
- Fully open the valve to flush the system
- Close valve to reduce flow approximately 2.5 turns
- Measure flow and adjust as necessary to obtain desire rate (5.5 – 6.5 ounces/minute)
- Tighten flow control valve set screw to lock valve in position
- Re-connect transfer hose
- Repeat the procedure for the next filter assembly if applicable



After adjusting the flow, remove the reservoir cover and visually verify flow to each evaporator assembly. Once the flow is verified, replace the cover and proceed with operational verification.

Section 6 – Operational Verification

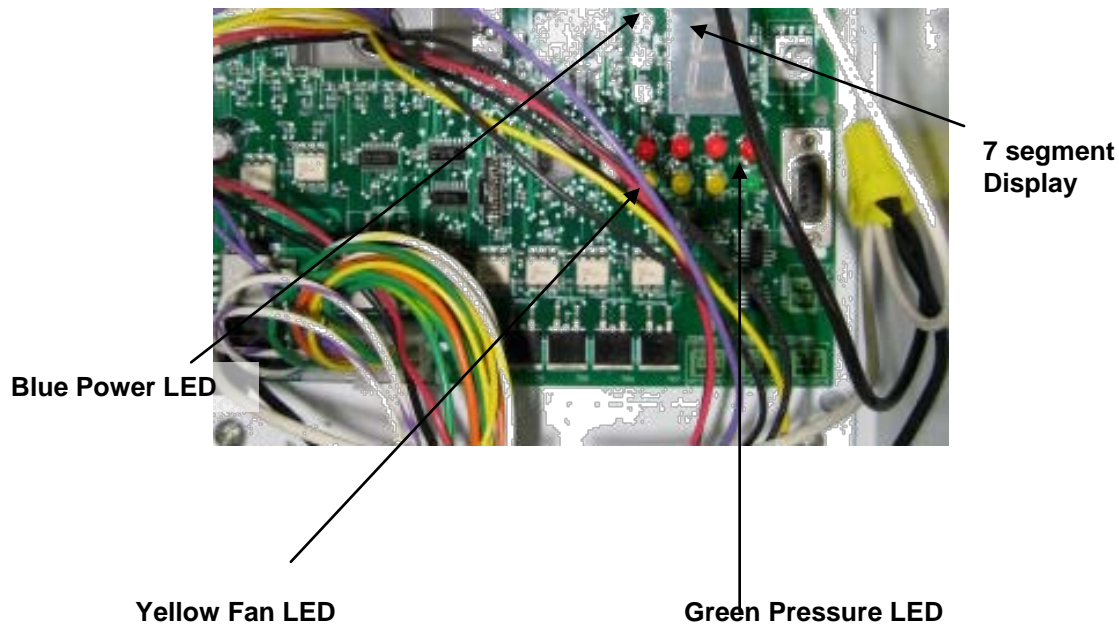
After installing the Intelli-Pur and setting the flow verify the proper operation of the system

With the equipment operating:

- Verify pressure to the system; pressure gage reading should be between 20 and 125 psi
- Verify power to the system; green operating light should be on and hour meter should be recording operation time

With the Electronic Control Module open:

- Verify control module operation; 7 segment display will be circulating segments and the topmost blue LED will remain lit solid.
- Verify evaporator operation; the red LED's will be lit on solid or flashing periodically. The green LED will be lit to indicate good operating pressure. The leftmost yellow LED will be lit to indicate the fan is operational. Finally check that the evaporator is getting hot by using an Infra-Red thermometer.



Maintenance

Section 7 – Service Parts

Part Description	P/N	Part Description	P/N
Replacement Filter	M-300-A		
Sampling Valve	P-104-A		
Flow Control Valve	P-112-A		

Section 8 – Replacing the OPS Filters

The recommended service intervals for various applications are listed on page 14. These should only be considered guidelines and ultimately intervals should be based on many factors including sample results, operating environment, maintenance practices, and company objectives.

To replace the OPS Filters on the Intelli-Pur system:

1. Close the shut-off valve and verify that the system pressure is zero (0).
2. Place an oil drain pan below the filter being changed.
3. Remove the used filter either by hand or with a filter wrench/strap. When using a filter wrench/strap make sure the tool is positioned within 2 inches of the top.
4. Before installing the new filter, lubricate the O-ring with clean oil (do not pre-fill filter). Tighten by hand until the gasket contacts the base, then rotate an additional 3/4 turn to ensure proper seating. **DO NOT USE A FILTER WRENCH AND DO NOT OVERTIGHTEN** as this may damage the unit.
5. Check the reservoir fluid level and fill as necessary.
6. Open the shut-off valve and check for leaks.



Always wear proper personal protection equipment such as oil-resistant gloves and safety glasses when handling oil products.

Section 9 – Taking an Oil Sample

Frequency

We recommend that you:

- Take fluid samples when filters are changed
- or
- Take oil samples at reduced intervals if results of the previous sample indicate a potential issue.

Procedure

1. Insure that the sampling valve is closed (as shown in Figure 1).
2. Remove the cap from the sampling valve.

Note: To ensure an accurate sample reading, purge the sampling valve to flush out impurities that may have settled in the valve opening.

3. Hold a clean sampling bottle under the sampling valve and open the valve until the bottle is filled to the top line. **DO NOT completely fill the sample bottle as it may cause leaking during shipping.**
4. Screw the cap tightly onto the sample bottle.
5. Screw the Safety Cap back onto the Sampling Valve.

Section 10 – Sample Submission and Registration

To submit a sample please ensure that the labels and forms are filled out completely and accurately.

- On the sample bottle enter: the Company Name, the Company Unit number (in the Unit ID: field), and the date (*Fig. 7*).
- On the sample processing form below, you must complete all of the items in **bold** in order to receive a complete sample analysis (*Fig. 8*).
- Include hours on the equipment and hours on the fluid on the sample bottle label. This important information helps oil analysts determine correct contamination levels.

OIL PURIFICATION SYSTEMS, INC.



Fig. 7 – Sample bottle and shipping container. (Be sure to completely fill out the information on the label.)

If the sample is the first taken for the unit, the account registration form must also be filled out and submitted with the sample.

Fig. 8 – The Account Registration Form

ACCOUNT REGISTRATION FORM			
I would like to receive my reports via:		<input type="checkbox"/> E-mail	<input type="checkbox"/> Fax
		0000A00000 www.trackmysample.com	
Customer (sample source)			
Distributor/Sales Rep			
Attention			
Telephone			
Email Address			
Customer's Address		Fax Number	
State/Province		City	
Postal Code		Country	
COMPONENT REGISTRATION FORM			
Mandatory for first time component sampling or to make changes. Always use same unit ID on future samples.			
*Account Number (If not available Account Registration Form must be completed)			
OPSTR		Secondary ID	
Unit ID			
POSITION (if applicable): <input type="checkbox"/> Chassis <input type="checkbox"/> Left <input type="checkbox"/> Right <input type="checkbox"/> Front <input type="checkbox"/> Rear <input type="checkbox"/> Center			
UNIT TYPE (check sampled component)			
ENGINES <input type="checkbox"/> Diesel <input type="checkbox"/> Gasoline <input type="checkbox"/> Natural Gas <input type="checkbox"/> LP Gas <input type="checkbox"/> Dual Fuel		MOBILE GEAR / BEARING SYSTEM <input type="checkbox"/> Differential <input type="checkbox"/> Final Drive <input type="checkbox"/> Planetary <input type="checkbox"/> Steering <input type="checkbox"/> Wheel Hub <input type="checkbox"/> Other	
TRANSMISSION <input type="checkbox"/> Manual <input type="checkbox"/> Auto/Powershift <input type="checkbox"/> Torque Converter <input type="checkbox"/> Hydrostatic Trans <input type="checkbox"/> Other		HYDRAULIC <input type="checkbox"/> Piston Pump <input type="checkbox"/> Gear Pump <input type="checkbox"/> Vane Pump <input type="checkbox"/> Other	
AA ABUNL BANGE BALPG AA2F		BBDFR BBFDR BBPLT BBSTG BGWHL	
BBMNT BBAPT BBTRQ BHHYD		BHPJP BHGP BHVAN	
Unit Manufacturer		Unit Model	
Application <input type="checkbox"/> Transportation-100 <input type="checkbox"/> O-T-R Trucking-110 <input type="checkbox"/> Pickup/Delivery-120 <input type="checkbox"/> City/Highway Transit-130 <input type="checkbox"/> Municipal Vehicle-155 <input type="checkbox"/> Ready Mix Concrete-180 <input type="checkbox"/> Off-Highway-200 <input type="checkbox"/> Construction-220 <input type="checkbox"/> Waste Handling/Landfill-230 <input type="checkbox"/> Agricultural-280 <input type="checkbox"/> Quarry-285 <input type="checkbox"/> Marine-500 <input type="checkbox"/> Mining-500 <input type="checkbox"/> Coal Mining-540 <input type="checkbox"/> Aggregate-650 <input type="checkbox"/> Automotive-700 <input type="checkbox"/> Railroad-800 <input type="checkbox"/> Other			
Lube Manufacturer		Lube Product Name	
Filter <input type="checkbox"/> Full-Flow-10 <input type="checkbox"/> By-pass-11 <input type="checkbox"/> Kidney Loop - 16 <input type="checkbox"/> Extended Drain - EX <input type="checkbox"/> None <input type="checkbox"/> Other		Lube Grade <input type="checkbox"/> SAE <input type="checkbox"/> ISO	
Filter Size <input type="checkbox"/> 4 in <input type="checkbox"/> 6 in <input type="checkbox"/> 8 in <input type="checkbox"/> 10 in <input type="checkbox"/> Cartridge		Filter Brand <input type="checkbox"/> OPS <input type="checkbox"/> Other	
Smallest Filter Micron Rating In System		Sump Capacity	
Specify additional testing requested			
Special comments or problems?			

OIL PURIFICATION SYSTEMS, INC.

For U.S. Mail: apply address label for lab nearest your location (supplied with bottle label form), add proper postage and mail the mailing container.

For UPS in optional UPS Prepaid box: place mailing container in UPS box (provided), apply shipping label and drop in UPS box, bring to UPS Store or hand to a UPS Driver. *(UPS Prepaid boxes are available from OPS.)*

Section 11 – Diagnostics

Condition	Resolution
Green indicator light on controller door is flashing	<p>This indicates a diagnostic condition that has occurred and the controller has taken action to prevent overheating of the fluid. The following explains steps to be taken to rectify the condition.</p> <p>Open the controller door and follow the steps outlined below to resolve the issue.</p>
Green LED on the controller is flashing	<p>This indicates lack of proper operating pressure. Rectify the condition by making sure that proper pressure is available. Then reset the condition by pressing and releasing the Green indicator light switch on the door.</p>
Red LED or LED's are off and the 7 segment display is cycling numbers between 1 and 4.	<p>This indicates improper heating of the evaporator cup. The cup in question is indicated by the number displayed on the display. The heaters are fixed 1 to 4 going from left to right.</p> <ol style="list-style-type: none"> 1. Check for proper operating pressure. 2. Check the differential pressure gauge and make sure it is green. If it is not, it indicates the filter has reached capacity and needs to be replaced. Replace filter if necessary. 3. Open the reservoir cover and make sure that there is proper flow. If the flow is not sufficient then open the flow control valve and flush. Reset the flow control valve to obtain proper flow rate as detailed in this document. <p>Reset the condition by pressing and releasing the Green indicator light switch on the door. Let system run and ensure that the condition has been resolved.</p>

Section 12 – Troubleshooting

<i>Issue</i>	<i>Resolution</i>
Leak at filter-to-base Seal	<ul style="list-style-type: none"> • Check for dirt around O-Ring & that it's seated properly • Ensure proper installation (i.e.: Seal lubricated before installation and filter is properly tightened)
Leak at hose connections	<ul style="list-style-type: none"> • Ensure that all connections are properly tightened • Verify use of thread tape or sealant on all NPT (pipe) threads
ECU does not light up at all	<ul style="list-style-type: none"> • Check for proper power source • Check breaker • Check connections
Top most Blue LED does not come on after power up	<ul style="list-style-type: none"> • Check for proper power source • Check breaker • Check connections
Green LED on board does not come on	<ul style="list-style-type: none"> • Check to see if pressure is available and is within proper operating range of 25 to 125 psi
Red lights do not come on at all	<ul style="list-style-type: none"> • Check if Green LED is on – pressure is correct • Ensure that all connections are firm and properly made
Yellow Fan LED does not come on	<ul style="list-style-type: none"> • Check to see if pressure is within range and the Green LED is on

If you have any additional issues, questions or concerns, call a Field Service Tech at 866-OILPURE (645-7873), ext. 4.

OIL PURIFICATION SYSTEMS, INC.

Oil Purification Systems, Inc. ("OPS") warrants that Intelli-Pur shall be free from defects in materials and workmanship, and will substantially conform to its specifications for a period of two (2) years after the date of purchase (the "Period"), provided Intelli-Pur is properly installed, operated, and maintained, and, in each instance, in accordance with the documentation.

Should Intelli-Pur have been found and demonstrated to be defective during the Period for the reasons covered by this Limited Warranty, OPS, at its option, shall:

1. REPAIR Intelli-Pur or part thereof; or
2. REPLACE Intelli-Pur or part thereof.

In the event of a discrepancy between any purchase order accepted by OPS and this warranty, the terms of this warranty apply. OPS reserves the right to use either new, used, or refurbished parts.

This Limited Warranty does not cover any damages caused by you or due to external causes, including any act of God, natural disaster, accident, flood, war, sabotage, terrorism, military actions, or problems with the engine, e.g., failure to maintain the engine in accordance with its documentation (other than manufactures recommended oil changes). OPS does not warrant that Intelli-Pur will be free from design defects or errors.

To request warranty service from OPS, you need to contact OPS within five (5) calendar days following discovery of the defect or damage at the following telephone number: (866) OIL-PURE; or address:

Oil Purification Systems, Inc.
2176 Thomaston Ave
Waterbury, Connecticut 06704

and return Intelli-Pur or the defective part for inspection, including in such package a copy of the applicable warranty card, a detailed description of the problem, proof of purchase, and detailed records associated with the installation and maintenance of Intelli-Pur and the engine, and such other information as requested by OPS.

THESE WARRANTIES REPLACE ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY, NON-INFRINGEMENT, AND FITNESS FOR A PARTICULAR PURPOSE. THESE REMEDIES ARE THE SOLE AND EXCLUSIVE REMEDIES FOR ANY BREACH OF WARRANTY AND ONLY APPLY TO USE OF INTELLI-PUR IN THE UNITED STATES OF AMERICA, THE ORIGINAL PURCHASER FOR THE SPECIFIC ENGINE IDENTIFIED ON THE WARRANTY CARD, AND ONLY LASTS FOR AS LONG AS SUCH PURCHASER OWNS INTELLI-PUR AND THE APPLICABLE ENGINE.

OPS IS NOT RESPONSIBLE FOR ANY COST OF REMOVAL AND INSTALLATION, AND ANY INDIRECT, SPECIAL, PUNITIVE, INCIDENTAL, OR CONSEQUENTIAL DAMAGES RESULTING FROM ANY BREACH OF WARRANTY OR UNDER ANY OTHER LEGAL THEORY, INCLUDING, BUT NOT LIMITED TO, LOST PROFITS, DOWNTIME, GOODWILL, DAMAGE TO OR REPLACEMENT OF EQUIPMENT AND PROPERTY USED WITH INTELLI-PUR.

SOME JURISDICTIONS DO NOT ALLOW THE EXCLUSION OR LIMITATION OF IMPLIED WARRANTIES, INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATIONS OR EXCLUSIONS MAY NOT APPLY TO YOU. IF ANY OF THESE LAWS APPLY, THEN ANY EXPRESS OR IMPLIED WARRANTIES ARE LIMITED IN DURATION TO THE LIMITED WARRANTY PERIOD. NO WARRANTIES APPLY AFTER THAT PERIOD. IN ANY EVENT, OPS'S MAXIMUM LIABILITY SHALL NOT EXCEED THE PRICE RECEIVED BY OPS FOR INTELLI-PUR THAT IS SUBJECT TO THIS LIMITED WARRANTY.

THIS LIMITED WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS, AND YOU MAY ALSO HAVE OTHER RIGHTS THAT VARY FROM JURISDICTION TO JURISDICTION.