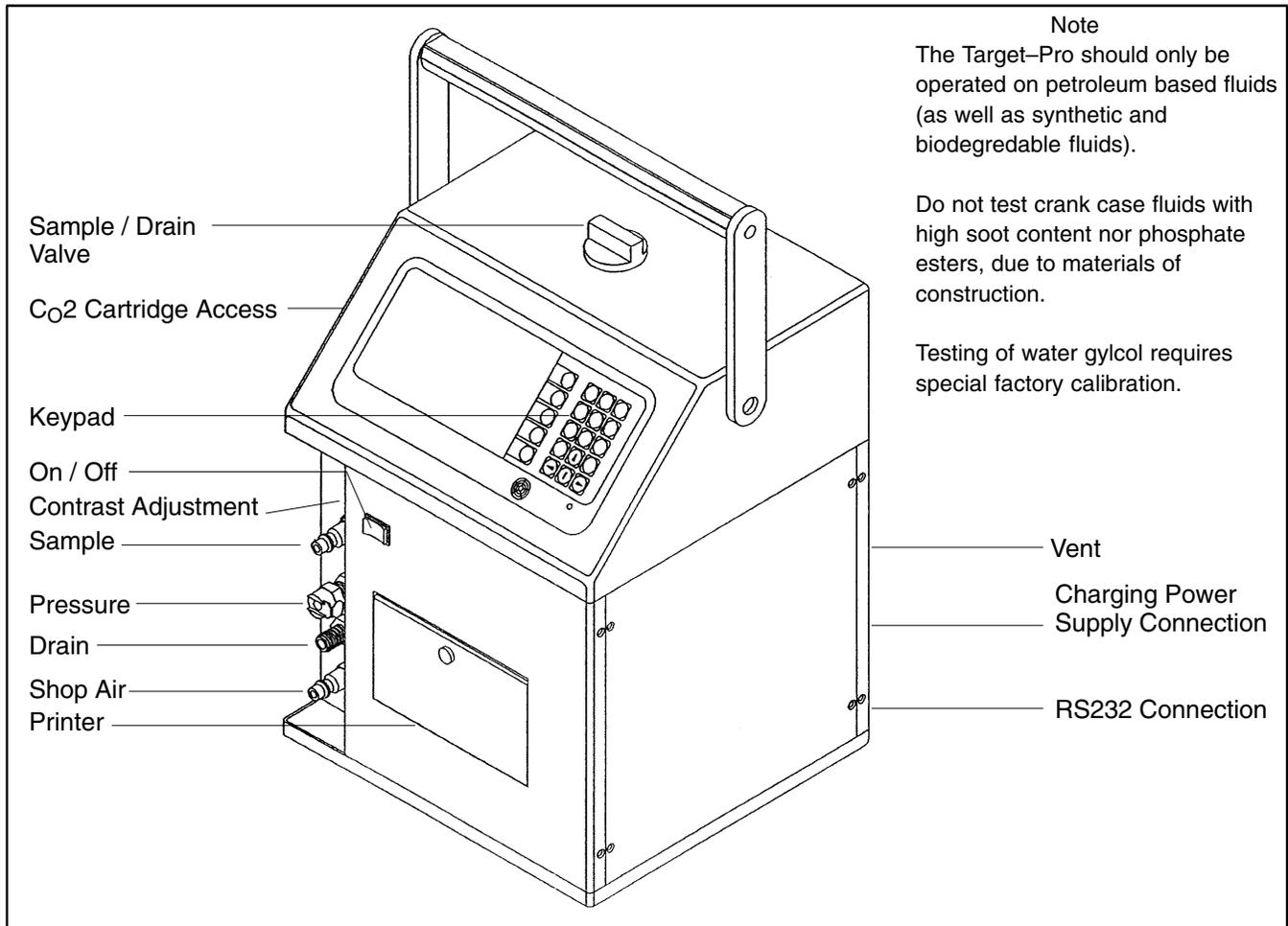


Target-Pro Portable Particle Counter



Table of Contents

Introduction	3
Technical Information	4
Getting Started	5
Operating the Online Sampler	6
Operating the Bottle Sampler	7
Operating the Bailing Probe Sampler	8
Accessing Memory/Downloading to a Computer	9
Test / Help Codes	10
Maintenance	11
CO ₂ Cartridge	
Paper Roll	
Battery	
Sensor	
Pneumatics	
Troubleshooting	13
ISO Cleanliness Code Table	14
Target-Pro Model Codes and Part Numbers	15



Introduction

The Vickers Target-Pro Portable Particle Counter is a convenient way to obtain laboratory quality particle count results in the field. It combines state of the art LASER particle counting technology with a user friendly interface and compact size to offer a useful tool that anyone can operate.

The Target-Pro Analyzer is supplied with one power charger, two CO₂ cartridges, one spare roll of paper and a sensor cleaning brush. The Online Sampler is

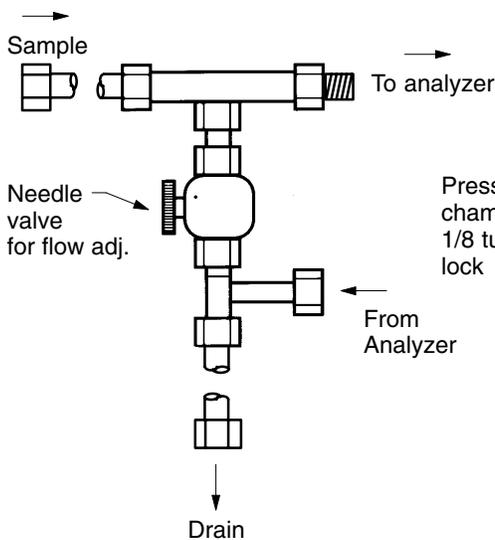
supplied with the Target-Pro Analyzer and includes one system sampling connector to install in a pressure or return line. The Bottle Sampler and Bailing Probe Sampler are available as options.

This easy-to-use analyzer allows maintenance and service departments to monitor the fluid cleanliness of hydraulic and lubrication systems, and take action if necessary.

The Vickers philosophy for Systemic Contamination ControlSM:

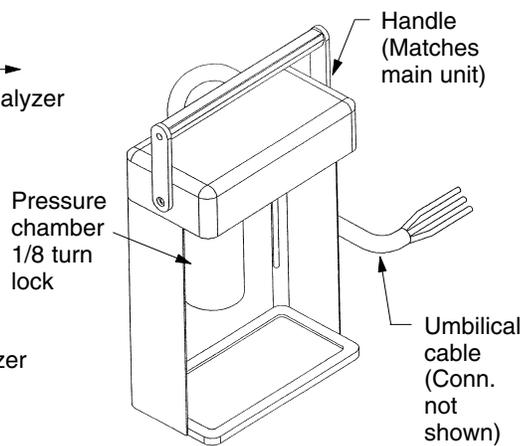
1. Set a Target Cleanliness Level for the system.
2. Achieve the Target Cleanliness by appropriate filter selection and placement.
3. Maintain the Target Cleanliness by monitoring the system and taking action as necessary.

On-Line Sampler



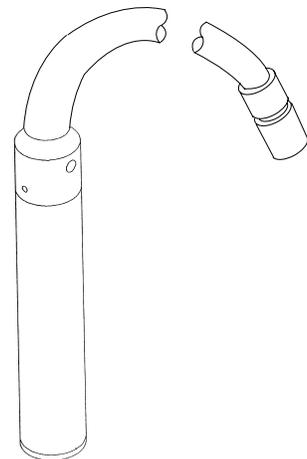
The Online Sampler connects to a pressure line or return line to test the fluid in the system, and observe the system dynamics as it operates.

Bottle Sampler



The Bottle Sampler tests a sample taken from anywhere in the system, collected in an ultra-clean bottle.

Bailing Probe



The Bailing Probe Sampler allows a quick and convenient test of the reservoir oil condition before the inlet pump.

Technical Information

TECHNOLOGY Automatic particle counting, LASER extinction	
Light Source	laser diode, 100,000 hours lifetime
Sensitivity	≥ 2, ≥ 5, ≥ 10, ≥ 15, ≥ 25, ≥ 50 micron ranges
Calibration	ISO 4402 procedures, factory adjusted
Sensor resolution	Better than 3% (NFPA procedure)
Coincidence limit	16,000 particles per ml. Allows particle counting to ISO Code 21

OPERATION Standard mineral and petroleum based fluids for hydraulic applications	
Flow Rate	20 ml / min. – 50 ml / min.
Viscosity	To 2000 SUS (431 cSt)
Power Source	12 Vdc rechargeable battery and 115/220 Vac power charger and supply. Standard on base unit.
Flexible Sampling Options	<p>Bailing probe sample method, requires regulated, filtered and unlubricated shop air connection 70 psi (4,8 bar) minimum – 100 psi, (6,8 bar) maximum or CO₂ cartridge.</p> <p>Bottle sample method, requires regulated, filtered and unlubricated shop air connection 70 psi (4,8 bar) minimum – 100 psi, (6,8 bar) maximum or CO₂ cartridge.</p> <p>On-line sampling method, pressure to 3000 psi, 207 bar maximum down to: 70 psi (4,8 bar) minimum for fluids 700 SUS (150 Cst) or higher 30 psi (2,1 bar) minimum for fluids 700 SUS (150 Cst) or lower</p>

NOTE:

Do not use the Target-Pro with crank case fluids due to high soot content nor phosphate esters, due to materials of construction.

USER INTERFACE Convenient and easy to understand	
Reports in ISO Cleanliness Code	Also reports average count of three tests for 2, 5, 10, 15, 25 and 50 micron ranges.
Internally Assesses Validity	If the test results of the three runs taken on one sample exceeds the set variation limit for the 5 μ counts, a warning is displayed.
Test Time	<140 seconds
Help Messages	Sample Inconsistent, Warning: Low Battery, Calibration Failure, Low Pressure
Data Storage	99 tests, stacking memory (first in, first out)
Computer Interface	Can download data through RS232 connection
Printer	Standard on base unit
Weight	20 pounds (9 kg)
Externals	Rugged steel, black, oil resistant with integral carry handle and removable shoulder strap
Optional	Heavy duty traveling case available

Getting Started

- **IMPORTANT: At initial set-up and periods of more than one day without operation, the Target-Pro must be flushed with clean fluid (ISO 16/14/11) or a petroleum based solvent (such as petroleum ether or mineral spirits) using any sampling mode.**

If the last sample tested was relatively dirty (above ISO 19/17/15), it is recommended to repeat this flushing procedure, or run the next sample twice to avoid cross contamination.

- **In addition, when switching from a high viscosity oil test to a low viscosity oil test, the Target-Pro should also be flushed, as stated above, to avoid cross contamination.**

1. Select a Sampler

Three sampler options are available: Bailing Probe, Bottle and Online. These provide a variety of ways for system monitoring and troubleshooting. Select a Sampler and connect it using the fittings on the front left hand side of the Target-Pro Analyzer. Each fitting on the analyzer is unique to ensure proper connection.

2. Select a Source of Pressure

When using the Bailing Probe Sampler or the Bottle Sampler, use a CO₂ cartridge or external pressurized air for pressure source.

NOTE

The Online Sampler's only requirement is a minimum line pressure of 30 psi (2,07 bar) for fluids with viscosity 700 SUS (150 Cst) or *lower* or 70 psi (4,8 bar) for fluids with viscosity 700 SUS (150 Cst) or *higher* up to a maximum allowable line pressure of 3000 psi (207 bar).

There are two pressure source options:

• CO₂ cartridge

Refer to the instructions in Maintenance – CO₂ Cartridge.

• External pressurized air supply

This source of air should be filtered, unlubricated and regulated to 70 psi (100 psi maximum). This can be attached to the bottom fitting on the front left hand side of the Target-Pro Analyzer.

3. Select a Source of Power

The Target-Pro operates with internal rechargeable batteries, or a 115/220 VAC power charger and supply which connects on the back panel of the Target-Pro Analyzer.

4. Turn on the Target-Pro and Set-Up for Operation.

Turn on the Target-Pro pressing the power switch, located on the front left hand side of the Target-Pro Analyzer, to the "ON" position. You are at the MAIN MENU. Adjust the screen intensity with the contrast knob located below the on/off switch.

Press the OPTIONS key.

- Note the flow rate. Set at a rate of 25 ml/min to test for fluids with viscosities up to 2000 SUS (431 Cst). For fluids with viscosity below 700 SUS (150 Cst), the flow rate may be adjusted to 50 ml/min to speed the testing process. Use the down arrow to the next line.
- Note the date. If incorrect, reset it by typing in the correct date using the numeric keypad. Use the left and right arrows to move left and right. Use the down arrow to the next line.
- Note the time. If it is incorrect, reset it by typing in the correct time using the numeric keypad. Use the down arrow to the next line.

- Note the mode of operation. Press the left or right arrows to scroll through the BAIL, BOTTLE, or ONLINE options to select the desired Sampler Mode.

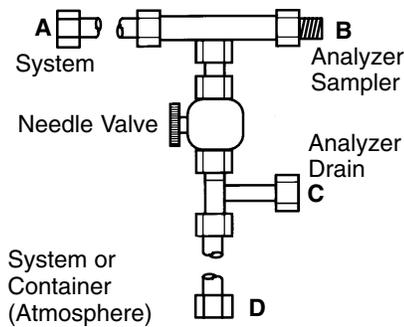
- Note the printer setting. Press the left or right arrows to select ON or OFF. If ON, the results will automatically print on paper as the sample drains. If OFF, the results are stored in MEMORY. Both settings allow results to be displayed on the screen.

Press the RETURN key to go back to the MAIN MENU.

RETURN will always send you back to the MAIN MENU.

If there is a delay while operating the Target-Pro, the screen-saver will cause the screen to darken... just press any key and the screen will return.

Operating the Online Sampler



CAUTION

Before operating the Online Sampler, always make sure the needle valve is completely closed (tight when turning clockwise).

The drain line must flow at atmospheric pressure. The external drain point quick disconnect (D) on the Online Sampler is normally closed to prevent dripping when not in use. If the drain line is not quick disconnected to a drain point, either remove the external drain point fitting from the Online Sampler or connect an external drain point fitting (one is supplied with the Online Sampler) to the internal fitting on the Online Sampler to create an open flow path.

Any statement in italics indicates the Target-Pro will prompt you with a similar statement.

System Preparation

To run a sample with the Online Sampler, it is necessary to have a minimum line pressure of:
30 psi (2,07 bar) for fluids with viscosity 700 SUS (150 Cst) or lower or
70 psi (4,8 bar) for fluids with viscosity 700 SUS (150 Cst) or higher
up to a maximum allowable line pressure of 3000 psi (207 bar).

To prepare a system for Online Sampling, a sample point external connector must be installed in the system pressure line or return line (one supplied with Online Sampler, order others from Vickers, part 932349). The Online Sampler will then connect to this sample point on the system.

A drain point external quick disconnect may also be installed on the system.

The drain line on the Online Sampler must run at atmospheric pressure.

The internal quick disconnect on the Online Sampler is normally closed, and **must** be connected to a male quick disconnect or removed from the Online Sampler to allow flow.

Sample Preparation

The fluid sample should be taken from the system while it is in operation, either from a pressure line or a return line.

- Before operating the Target-Pro, in the Online mode, make sure all connections are in place. Start by connecting the Online Sampler to the Target-Pro Analyzer. Connect the sample (B) and drain (D) fittings to the corresponding fittings located on the front left hand side of the Target-Pro Analyzer. Note: There is no pressure connection to the Analyzer for the Online Sampler).
- Connect the (A) sample line connector to the sample fitting installed on the system line. **Note the system pressure must be less than 100 psi (7 bar) to allow connection.**
- Route or connect the drain line (D) to the appropriate place (a fitting, reservoir or a container). If not routed to an external quick disconnect installed on the system, either remove the female drain point quick disconnect from the Online Sampler or attach an external connector to create an open line.
- Slowly loosen the needle valve on the Online Sampler 10 full turns to allow flow to drain at approximately 1 cup /min (200 ml/min). Allow flow through the Online Sampler for 1 minute to ensure a representative sample. Maintain flow during the sample procedure.

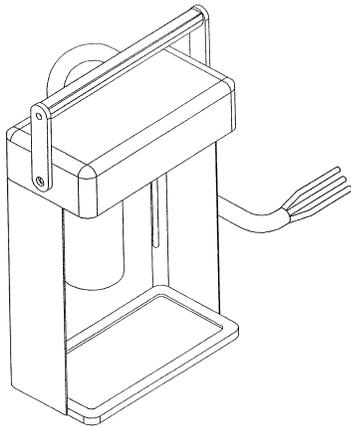
1. Press OPTIONS to ensure that you are in the Online Mode. Select ONLINE and press RETURN.

2. Press the START button on the MAIN MENU.
3. Enter the sample ID code. Use numeric key pad for numbers, and the up and down arrows for alpha characters. The left and right arrows will move the cursor left and right.
 - You can also scroll through the past 19 sample ID's entered to select your ID code using the ID LIST+ and ID LIST- keys. ID LIST- goes to the most recent ID code entered, and ID LIST+ goes nineteen samples back in the memory (Last In, First Out).
 - The samples are stored in memory using the sample ID, date and time. This will help you locate the data you want from memory if the same sample ID is used for many different samples.
 - If a sample ID is not entered, the results will automatically print out on paper after the sample is tested, but will not be saved in the memory
4. Press START to begin sampling.
5. Place the knob in the sample position, and the test begins. You can watch the test as it runs: 12 ml flush, three 10 ml test runs, and another 12 ml flush.
 - Press the STOP key to cancel the process at any time. Place the knob in the drain position.
6. Place the knob in the drain position when prompted.
7. Remove the sample line connection from the system. Note the system pressure must be below 100 psi (32 bar) to allow disconnection.
8. Make sure the drain lines are emptied to the appropriate place before disconnection.
9. Tighten the needle valve to prepare for next test, or to prevent dripping.

NOTE

The minimum, maximum and average counts for 2, 5,10,15, 25 and 50 micron size particles and the associated ISO code are stored in the memory, which holds 99 samples. At the point where more than 99 samples are entered into memory, the first sample entry will be "bumped" out of memory (first in, first out).

Operating the Bottle Sampler



Any statement in italics indicates the Target-Pro will prompt you with a similar statement.

Sample Preparation

The fluid sample should be taken from the system into an ultra-clean sample bottle. Before testing on the Target-Pro, swirl the sample in the bottle for at least 2 minutes to re-suspend any particles that may have settled. Avoid abrupt shaking motions to prevent air entrainment resulting in bubbles. If air bubbles are present in the sample, use an ultrasonic bath or let the sample sit until they disappear.

- **IMPORTANT: At initial set-up and periods of more than one day without operation, the Target-Pro must be flushed with clean fluid (ISO 16/14/11) or a petroleum based solvent (such as petroleum ether or mineral spirits) using any sampling mode.**

If the last sample tested was relatively dirty (above ISO 19/17/15), it is recommended to repeat this flushing procedure, or run the next sample twice to avoid cross contamination.

1. Press **OPTIONS** to ensure that you are in the **Bottle Mode**. Select **BOTTLE** and press **RETURN**.

- Keep a container under the drain tube in the Bottle Sampler to capture the fluid as it drains back from the Target-Pro Analyzer.

2. Press the **START** button on the **MAIN MENU**.

3. *Place the sample bottle into the metal chamber* and install the metal Bottle Sampler chamber by aligning the marks on the chamber and turning until tight and secure, aligning the marks in the closed position.

- If the metal chamber is difficult to install, remove any hydraulic fluid or debris from the O-ring and apply high vacuum grease to ease installation.

4. Place a container under the plastic drain tube on the right side of the Bottle Sampler.

5. *Enter the sample ID code*. Use the numeric key pad for numbers, the up and down arrows for alpha characters. The left and right arrows will move the cursor left and right.

- You can also scroll through the past 19 sample IDs entered to select your ID code using the **ID LIST+** and **ID LIST-** keys. **ID LIST-** goes to the most recent ID code entered, and **ID LIST+** goes nineteen samples back in the memory (Last In, First Out).

- The samples are stored in memory using the sample ID, date and time. This will help you locate the data you want from memory if the same sample ID is used for many different samples.

- If a sample ID is not entered, the results will automatically print out on

paper after the sample is tested. The test will not be stored in memory.

6. *Press **START** to begin sampling.*

7. *Place the knob in the sample position*, and the test begins.

You can watch the test as it runs: 12 ml flush, three 10 ml test runs, and another 12 ml flush.

- If you need to stop before or during the sample process, press the **STOP** key.

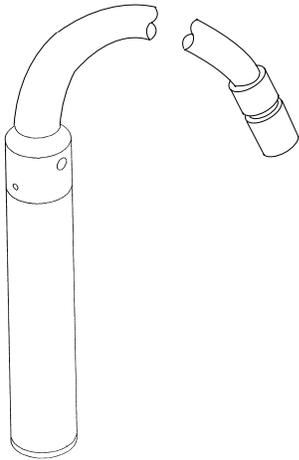
8. *Place the valve in the drain position* when the Target-Pro tells you to.

- While the sample is draining, you may remove the sample bottle from the metal chamber.

NOTE

The minimum, maximum and average counts for the 2,5,10,15,25 and 50 micron size particles and the associated ISO code will be stored in the memory, which holds 99 samples. At the point where more than 99 samples are entered into the memory, the first sample entry will be "bumped" out of memory (first in, first out).

Operating the Bailing Probe Sampler



NOTE: The Bailing Probe should be kept in a vertical position to prevent fluid from entering the pneumatics of the Analyzer. If fluid enters the pneumatics, see Maintenance–Pneumatics.

Any statement in italics indicates the Target–Pro will prompt you with a similar statement.

Sample Preparation

Before operating the Bailing Probe, make sure that the system to be tested has recently been in operation and that the fluid in the reservoir is at operating temperature. The area around the access port (typically the vent) should be very clean and free of debris. The best place to put the Bailing Probe for a representative sample is halfway down into the height of the fluid, and near the inlet of the pump. Be sure to allow enough time for the bail to fill. **The bail probe fill time is linear with viscosity:**

150 SUS (32 Cst)	20 seconds
2000 SUS (432 Cst)	70 seconds

- **IMPORTANT:** At initial set-up and periods of more than one day without operation, the Target-Pro must be flushed with clean fluid

(ISO 16/14/11) or a petroleum based solvent (such as petroleum ether or mineral spirits) using any sampling mode.

If the last sample tested was relatively dirty (above ISO 19/17/15), it is recommended to repeat this flushing procedure, or run the next sample twice to avoid cross contamination.

1. Press **OPTIONS** to ensure you are in the Bail Mode. Select **BAIL** and press **RETURN**.
2. Press the **START** button on the **MAIN MENU**.
3. Place the Bail Sampler in the sample fluid. Be sure to wait long enough for the Bailing Probe to fill, keeping the Bailing Probe in a vertical position, before starting the sample process.
 - For the first sample tested after the Bailing Probe is connected to the Target–Pro Analyzer, press **STOP** during the second 10 ml test run. Drain and restart the Bailing Probe procedure. This primes the Bailing Probe for normal operation.
4. Enter the sample ID code. Use the numeric key pad for numbers, the up and down arrows for alpha characters. The left and right arrows will move the cursor left and right.
 - You can also scroll through the past 19 sample IDs entered to select your ID code using the **ID LIST+** and **ID LIST–** keys. **ID LIST–** goes to the most recent ID code entered, and **ID LIST+** goes nineteen ID's back in the memory (Last In, First Out).
 - The samples are stored in memory using the sample ID, date and time. This will help locate the data from memory, if the same sample ID is used for many different samples.
 - If a sample ID is not entered, the results will automatically print out on

paper after the sample is tested. The test will not be stored in memory.

5. Press **START** to begin sampling.
6. Place the valve in the sample position, and the test begins. You can watch the test as it runs: 12 ml flush, three 10 ml test runs, and another 12 ml flush.
 - Press the **STOP** key to abort the sample process at any time. The analyzer assumes the run is finished, so some fluid may remain in the bail. Another complete run must be carried out to completely flush the bail and avoid cross contamination.
7. Place the knob in the drain position.
8. Press **YES** or **NO**, choosing whether or not to take another sample.
9. If **YES**, return to step 5.
10. If **NO**, Keep the bail sampler inside the reservoir while draining so the sample returns to the reservoir with no waste to dispose. Remove the bail sampler from the fluid before pressing continue or the bail will refill. Returning to the **MAIN MENU**, the results will be displayed on the screen.

NOTE

The minimum, maximum and average counts for the 2,5,10,15,25 and 50 micron size particles and the associated ISO code will be stored in the memory, which holds 99 samples. At the point where more than 99 samples are entered into the memory, the first sample entry will be "bumped" out of memory (first in, first out).

Accessing the Memory & Downloading Results

Accessing the Memory

1. At the MAIN MENU, press MEMORY. This brings you to the list of the last 99 tests.
2. Locate the test you wish to select by scrolling through the list using the up and down arrow keys. You can locate the desired test by looking for the sample ID plus the date and time.
3. Press VIEW to view the results on the Target-Pro screen.
4. Press PRINT to print the results on paper.
5. To download to a computer, the computer program must be in a communications mode. (Such as "PROCOMM" or Windows "Terminal") Type "R" at the computer prompt to receive the results at the Target-Pro cursor. Type "B" to receive the entire buffer contents. The results will be formatted as they appear on the Target-Pro screen.

To setup your computer for downloading information from the Vickers TargetPro:

- Once your computer is in Windows, double click on Accessories
- Double click on Terminal
Select "Settings"
Select "Terminal Preferences"
Select "TTY Generic" then click on OK
- Select "Settings" again
Select "Terminal Preferences"
Select "Echo on" then click on OK
- Select "Settings" again
Select "Communications"
Set the following switches:
Connector: COM1 or COM2
(whichever port you are using to download the TargetPro through)

Baud Rate: 9600
Data bits:8
Parity: None
Flow control: None
Stop bits: 1
Click on OK

- Select "File"
Click on "Save"
Type in: "TARGET.TRM" then click OK

Now your computer is configured to communicate with the TargetPro.

- Using a 9 pin serial cable (RS232), connect the TargetPro to the COM1 (or COM2) port on your computer.
- Turn on the TargetPro. A message from the TargetPro should show up on the screen (i.e:——Vickers TargetPro——)
- The TargetPro should be in the Main Menu screen during the downloading procedure

1. Enter the PROCOMM program.
2. Enter the EDIT pull down menu.
3. Select SCROLLBACK BUFFER TO.
4. Enter the drive and filename you wish to save the information as.
5. Begin down load of the TargetPro by typing R or B.
6. Exit PROCOMM, and the file is saved.

1. Enter the PROCOMM program.
2. Type ALT-F1 to begin the save.
 - a. It should ask you what to designate the filename to be.
 - b. Enter the desired filename to be saved to.
3. Type R or B to begin the download.
4. Type ALT-F2 to end the save.
5. The buffer is then saved to this file.

Test / Help Codes 8.

HELP CODES	WHY	CHECK/ACTION
SAMPLE INCONSISTENT	<ul style="list-style-type: none"> - The variation between the three test counts for 5μ and greater exceed the set limit: $\frac{\sigma}{\bar{\chi}} < 0.30$ 	<ul style="list-style-type: none"> - Did you run a representative, well mixed sample? - Was the Bail Sampler completely submerged before sampling? - Has the Bail Sampler had time to fill before sampling? - Was the sample bottle full before beginning to sample? (Bottle Sampler) - Are there air bubbles in the sample? - Could there have been cross contamination?
WARNING: LOW BATTERY	<ul style="list-style-type: none"> - The battery power is running low. When this first appears, one more sample may be taken. 	<ul style="list-style-type: none"> - Operate using auxiliary power. - Recharge the battery. A full charge takes two hours.
CAL-FAIL: SEE MANUAL	<ul style="list-style-type: none"> - The laser sensor has strayed from normal operating parameters, giving an error message of calibration failure. 	<ul style="list-style-type: none"> - Is there air in the lines or in the sample? Perform another test run before cleaning the sensor. - Clean the sensor (see Cleaning the Sensor) and retry the sample. - Contact Vickers or your Vickers Distributor to schedule for recalibration of the analyzer. <p style="text-align: center;">NOTE: <i>To ensure proper calibration, the Target-Pro should be checked for calibration every year.</i></p>
LOW PRESSURE	<ul style="list-style-type: none"> - There is an insufficient source of pressure to pressurize the sample chamber. 	<ul style="list-style-type: none"> - Is the flow rate too high for the fluid viscosity? For high viscosities near 2000 SUS (431 Cst) the flow rate can be adjusted down to 20 ml/min. - Replace the CO₂ cartridge with a new cartridge. (see Replacing the CO₂ cartridge) - Check shop air connections and source. - The sensor may be blocked. Clean the sensor (see Cleaning the Sensor) - Contact Vickers or your Vickers Distributor to schedule repair of the analyzer.

Maintenance

CO₂ Cartridge

CAUTION

A CO₂ cartridge is a vessel containing pressurized gas and must be handled with care. Do not drop a CO₂ cartridge or it might explode.

A 68 gram CO₂ cartridge typically lasts for 15 to 25 sample runs with the Bailing Probe or Bottle Sampler. To change the CO₂ cartridge, open the panel on left hand side of the Target-Pro. Slowly unscrew the cartridge one to three turns and allow any remaining pressure to vent before removing it entirely. Hand tighten a new cartridge into its fitting, turning quickly to avoid CO₂ loss, when the seal is broken.

- CO₂ cartridge replacements are available from Vickers. Order part number 932340.

Paper Roll

To replace the paper, open the printer door panel and slide the old paper core out of the locator slots. Remove the old paper core and replace it with a new roll of paper. Pull a lead off the roll and feed it into the printer from the bottom side of the roll, feeding it straight up against the back wall into the printer. Press the Line Feed key to move the paper through the printer. The shiny or coated side of the paper should be facing up when it comes out the top. Place the paper core back into the locator slots and roll the core to pick up any remaining slack in the roll. Order part number 932341.

Battery

The batteries should last three to five years before replacing.

To charge the battery, connect the charging power supply to the Target-Pro Analyzer. When the green battery light on the keypad blinks, the battery is fully charged. If the green light is steady, the battery is recharging. The Target-Pro can operate off of the charging power

supply while it is charging the battery. A red light indicates overcharge protection. If a red light appears, disconnect the charging power supply from the Target-Pro Analyzer and wait two minutes. Connect the charging power supply again, and the green light will appear.

Before charging the battery, down load or record all results in memory.

To change the battery, place the Target-Pro on a clean, flat surface. Remove the four panel screws and carefully lean the back panel down flat. Unhook the connector to the battery pack and remove it from the back panel. Install a new battery. Connect the charging power supply and fully charge the battery after installation. Enter the options menu to reset (flow rate, date, etc.) last parameters. Order part number 932342.

Things to Know About the Batteries:

- The special Ni–Cad battery in the Target–Pro does not have “memory” problems, which means you can recharge the batteries at any stage of use (you don’t have to let it run low before recharging).
- It only takes two hours to fully charge the batteries from low to full charge.
- Typical battery life is 3 to 5 years.

Sensor (Cleaning)

- **IMPORTANT:** At initial set-up and periods of more than one day without operation, the Target-Pro must be flushed with clean fluid (ISO 16/14/11) or a petroleum based solvent (such as petroleum ether or mineral spirits) using any sampling mode.

To clean the sensor, remove the sample line quick disconnect on the front of the Target-Pro using an open end box wrench. Insert the wire brush until it cannot enter any further. Use

push, pull and clockwise motions to clean the flow cell.

Reinstall the quick disconnect – snug tight only.

After the wire cleaning is complete, flush the sensor using clean fluid (ISO 16/14/11) or a petroleum based solvent (such as petroleum ether or mineral spirits). This flush can be done in any sampling mode.

Service and Calibration

The Target-Pro is provided with a one year warranty and should be calibrated annually. Field verification of the Target-Pro calibration can be carried out using a prepared standard calibration fluid, available from Vickers.

Post-warranty Service Agreements can be arranged through Vickers or your Vickers Distributor. Before shipping a Target-Pro for any service, please contact Vickers or your Vickers Distributor to obtain a Return Authorization Number.

MODEL NO.	_____		
PART NO./REV	_____		
DATE OF MFR.	_____		
SERIAL NO.	_____		
VOLTS	_____	HERTZ	_____
THIS PRODUCT COMPLIES WITH 21 CFR CHAPTER 1, SUBCHAPTER J			

Pneumatics (Flushing)

Fluid can be flushed from the pneumatic lines of the Target-Pro using “canned air”. On the Target-Pro Analyzer, open the “Pressure” port fitting on the front left hand side by inserting a flat blade screwdriver or a plastic tube extension from the canned air container to push the check valve inward. Flush the line with the canned air. The Bailing Probe and Bottle Samplers may be flushed in the same manner by blowing the canned air through the “Pressure”

connectors which attach to the
Target-Pro Analyzer.

Troubleshooting

PROBLEM	SOLUTION
Metal chamber is difficult to install on the Bottle Sampler.	Clean excessive oil off the chamber and its connection. Apply high vacuum grease to O-ring.
Fluid is coming out of the drain line (Bottle) or drain port (Bailing Probe) while sampling.	Call Vickers representative to schedule service and repair.
The printer is not working.	Verify that paper is in unit. Check for paper jam inside of printer head. The printer may be programmed in the "OFF" mode – check OPTIONS menu.
CO ₂ cartridge lasts for only a few samples.	Check that the cartridge has been properly tightened and installed. Refer to how to install a CO ₂ cartridge.
Unexpectedly high sample results.	Check the sample for air bubbles. Clean the sensor.
The Target-Pro will not turn on or "Low Battery" warning	<ol style="list-style-type: none"> 1. Connect the charging power supply to the Target-Pro. When the green light blinks, the battery is fully charged. 2. If the green light blinks after one minute and the Target-Pro will not turn on, contact your Vickers representative to arrange for service. 3. If the green light is steady, the battery is recharging. The Target-Pro can operate off of the charging power supply while it is charging the battery. 4. A red light indicates overcharge protection. If a red light appears, disconnect the charging power supply from the Target-Pro Analyzer and wait 2 minutes. Connect the charging power supply again. The green light will appear.
The printout is not dark enough.	The batteries should be recharged. A fully charged battery will cause the print to appear darker.
Bail is taking excessive time to fill.	Clean air lines of possible liquid contaminant. (See Maintenance - Pneumatics)
Bail is running out of sample before test is complete.	Make sure enough time is allowed to fill the Bailing Probe. Fluid with viscosity of 2000 SUS (431 Cst) will need 70 seconds to fill.

ISO 4406:1987(E)

ISO 4406:1987(E)

Number of Particles per milliliter		
More than	Up to and including	Scale Number
80,000	160,000	24
40,000	80,000	23
20,000	40,000	22
10,000	20,000	21
5,000	10,000	20
2,500	5,000	19
1,300	2,500	18
640	1,300	17
320	640	16
160	320	15
80	160	14
40	80	13
20	40	12
10	20	11
5	10	10
2.2	5	9
1.3	2.5	8
0.64	1.3	7
0.32	0.64	6
0.16	0.32	5
0.08	0.16	4
0.04	0.08	3
0.02	0.04	2
0.01	0.02	1
0.005	0.001	0
0.002.5	0.0005	0.9

Typical Printer Output

Eaton TARGET-PRO

DATE 01/06/95 TIME 13:17:35

Sample: MACHINE 1

Sample Volume: 30ml

Flow Rate: 25 ml/min

Reported Values: COUNTS / ml

ISO: 21/17/13

	MIN	MAX	AVG
2 μ	20879	25738	22485
5 μ	1008	1239	1116
10 μ	103	127	113
15 μ	38	47	41
25 μ	7	12	9
50 μ	0	1	0

Target-Pro Model Codes and Part Numbers

Analyzer and Sampling Methods	Model Codes
Target-Pro Analyzer with On-Line Sampler	TP110
Bottle Sampler (only)	TP210
Bailing Probe (only)	TP310
<p>The On-Line Sampler is standard with the Target-Pro Analyzer. It is configured with a four-foot sample hose assembly, a four-foot drain hose, and one (1) 1/8 in. NPT external and internal quick disconnect for one system sample point.</p>	
On-Line Hose Assemblies	Part Numbers
Sample hose assembly	
(High pressure hose with 1/4 in. fractional tube adapter end connections)	
4 ft. (1.2 m) hose	932343
6 ft. (1.8 m) hose	932344
Custom length hose available	
Drain hose assembly	
(1/4 in. OD x 3/16 in. ID tubing with 1/4 in. compression nut connection)	
4 ft. (1.2 m) hose	932346
6 ft. (1.8 m) hose	932347
Custom length hose available	
External drain point external connector (1/8 in. quick disconnect with ferruleless end connection)	932351
External drain point connector assembly (1/8 in. quick disconnect with ferruleless end connection)	932352
Sample point external connector (1/4 in. tube x 1/8 in. NPT)	932349
Sample point quick disconnect internal coupler and external nipple (1/8 in. NPT end connections)	932350
Accessories	
Ultra-clean bottles (20 / carton)	932399
CO ₂ cartridges (5 / carton)	932340
Printer paper (2 rolls / carton)	932341
Spare battery	932342
Heavy duty carrying case – Sensing unit	932353
Heavy duty carrying case – Sensing unit and Bottle sampler	932354
Related Literature	
Eaton Guide to Systemic Contamination Control	# 561