■ **The proflo Single Point Test Device precisely detects where and how much oil is wasted at any single point on a compressor. A pressure gauge on the device indicates operating pressure so problems with specific lube points, packing glands or injection holes can be pinpointed.**

TEST KIT FOR COMPRESSOR SINGLE-POINT LUBE-OIL MONITORING

CC Technology's Single Point Test Device Can Test the Quantity of Oil Injected into any Single Point on a Compressor and Verify Point Operating Pressure

By Ellen Hopkins

Verifying the reliability of divider blocks and lube pumps can save a compressor operator money. If costly oil is being wasted, an operator — in as little as 15 minutes — can detect precisely where and how much is wasted with a simple-to-use test kit known as the proflo SPTD (Single Point Test Device). The new device, from CC Technology (CCT) in Midland, Texas, U.S.A., has the ability to test the quantity of oil injected into any single point on the compressor and verify the operating pressure of the lube system at that point. It is a refined edition of the proflo divider block system monitor that CCT began marketing in 2002 and that Ariel Corp. is now installing at the factory on all its compressors.

The original proflo was invented to store and trend all lube system-related data and to coordinate with any hand-held pda using Palm operating software. Operators have been using the downloaded historical trending data to detect potential lube system problems such as over and under lubrication. The proflo SPTD refines that capability, leaving no doubt about precisely where the problem is.

"Many times in the past we have needed the knowledge of how much oil is going into a single point in order to prove reliability, not only of the divider block but of each lube pump on a pump per point system," said the device's inventor and owner of CCT, Curtis Roys. "Now we can put the proflo SPTD on any point and tell if a particular pump is failing.

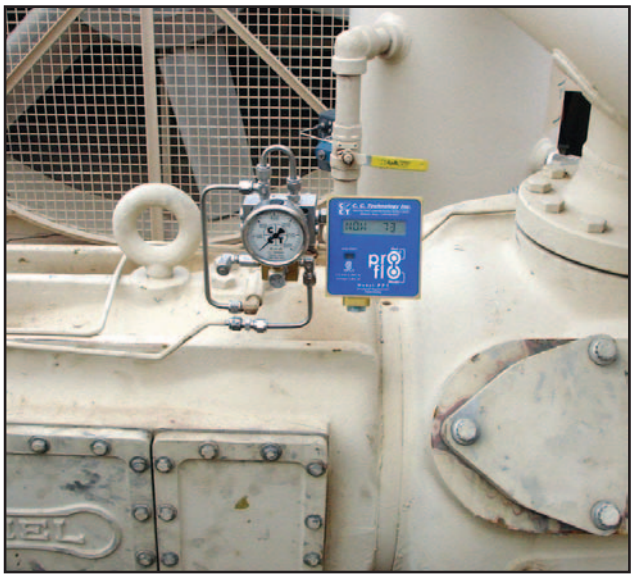
"There aren't a lot of tools that compressor manufacturers can be convinced to add as standard equipment," said Lloyd Roberts with Compressor Systems Inc. "It's a long process and Curtis Roys has done an excellent job of working with Ariel to accomplish that. We applaud his efforts on the proflo and the proflo SPTD device. The proflo is a true indicator of the cylinder lube system and of daily oil usage on a package. Oil is one of the highest costs an operator has. So it's imperative to monitor the oil because it's a way to manage maintenance costs."

"Oil consumption for the average operator's compressor runs between 25% and 35% of bottom line operating costs," Roys continued. "If we can give them the ability to pinpoint and track those oil volumes and costs in one package, that's something they have never had before."

"We've been using the proflo for approximately 18 months, since it was first prototyped and we now have 25 installed on compressors in West Texas," said Buddy Dickson, maintenance foreman with New Star Joint Venture. "We've been able to track our compressor lubrication rates and to trend all that information. We're also using them to keep up with our downtime because the device has a counter that keeps track of runtime. But primarily it saves us lubrication."

Dickson said the initial units almost immediately paid for themselves. He said, "The oil we saved when we in-

A Compressor Systems Inc. mechanic overlooks the operation of a Single Point Test Device on this Ariel compressor. CSI's Lloyd Roberts said monitoring oil is a way to manage maintenance costs.



The SPTD is used to monitor the oil volume injected into a compressor's rod packing. Lubrication rates can be tracked and trended using the SPTD and a Palm Pilot with associated software.

stalled the first five proflo devices was so significant, that we saved enough to pay for purchasing proflo devices for the rest of our units."

The Proflo SPTD includes a special magnetic assembly connected to the device's dispensing valve, which has one inlet and one outlet. The oil passing through the inlet and outlet is measured at specific time intervals and data are stored and trended. Anyone on-site can download these data to a Palm device from the proflo and can determine whether a single lube pump is worn out or whether the divider block is worn.

"Previously, divider blocks were tested for reliability by pressure testing it when it was sitting still and not under actual operating conditions," Roys said. "Problems with the divider block can be undetectable, however, without checking it under actual working pressures."

As an example, Roys cited an operator who was replacing the rod packing in one of his compressor's four cylinders every 10 to 12 weeks. The same cylinder continued to need packing replacement at that frequency for nearly two years. The divider block tested "good" every time it was checked under sitting conditions and the operator's mechanics eventually considered the continual packing replacement as normal wear for that compressor packing gland. Roys explained that the proflo SPTD indicated that when the compressor was started up, the correct amount of oil was going into that cylinder. But the minute the compressor was loaded, the volume of oil injected into that cylinder dropped by 50%. He said without the SPTD, that operator might still be replacing the packing.

Roys said with the proflo SPTD, operators noticing continued wear in a cylinder can determine if too small a quantity of oil in the cylinder is causing the wear. If plenty of oil is being injected and there is still wear, then it's evident that something else mechanical is wrong and over lubrication can cause valve failure.

"The device has a pressure gauge on it and we know the pressure it takes to get oil into that cylinder," he said. "So if the SPTD indicates that the discharge pressure is reading 1500 psi (103.5 bar) instead of the required 1000 psi (69 bar), then we know there is a partial blockage at that injection point in the cylinder that needs to be fixed. If the gauge is reading an excessive amount, we know there is either something wrong with the lube point, something wrong with the way the packing gland was put together, or maybe something wrong with the injection hole. In other words, we can troubleshoot a single injection point for the correct quantity of oil and operating pressure. Given that knowledge, the SPTD provides the ability to determine within 15 minutes whether the lube system is working correctly."

Roys described the proflo SPTD as a test kit consisting of a case containing the proflo, the dispensing valve, and a Palm Pilot device with the associated software. Everything is included in the test kit so a mechanic can go on-site to any compressor injection point and begin testing.

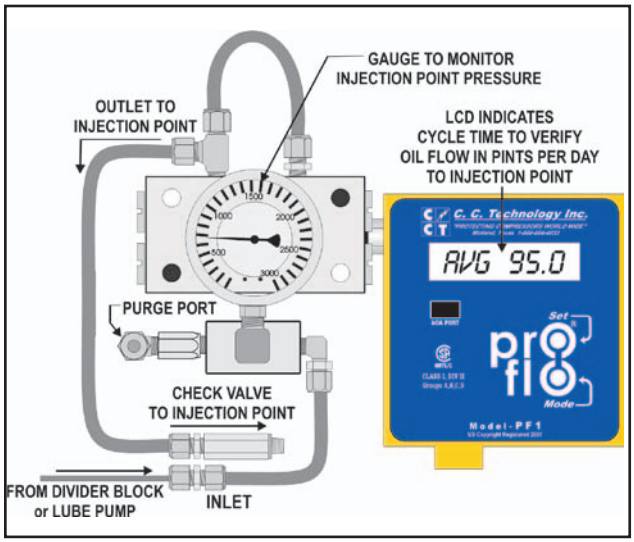
"The Fluid Flow Trending software is included in the test kit to ensure that the purchaser has everything necessary to make full use of the SPTD," Roys said. "If a customer already has our software installed for use with the proflo, it isn't necessary to reinstall the software."

The device is not intended for permanent attachment. Rather, Roys said it's a test kit to quickly prove the reliability of the lubrication system. Roys said if more comprehensive data is required, a mechanic could leave the test kit attached for an entire day, download the data to a Palm Pilot, and forward that information to management for comparison and trending. By leaving the device attached for two or three days, the SPTD results will indicate oil injection volumes as the temperature and operation of the lube pump fluctuated between night and day. This can be critical to determining if the divider block or lube system has problems associated with temperature changes during the day or night, he said. The results can signal that too little oil is getting into the injection point that the divider block or pump is feeding. If it's working correctly, a consistent amount of oil would be injected 24 hours per day.

In addition, Roys said the SPTD can be rigged so it is installed semi-permanently and continually sends a signal to an operator's control room. The proflo has been so well received that Roys said his company is manufacturing them in quantities of 500 every 60 days and the SPTD sales are growing monthly.

Another option for the proflo family of products under development — the proflo II — will have the ability to communicate with industry standard control panels and to send that oil consumption data over the Internet.

"In other words, all digital data downloaded via a Palm device will be viewable on the



Schematic diagram showing the components of SPTD and connections for monitoring injection points.

Web," he said. "Instead of an operator having to physically download the data at the compressor site, there will be an option to view oil consumption and runtime history on the Internet through a standard web browser," said Roys.

Nearing the manufacturing stage is another invention designed to replace the industry's oil counters, which he said haven't changed in the last 50 years.

"This product will monitor all the oil consumption of the compressor," Roys said. "We developed the proflo to monitor the oil used in the compressor cylinders and packing. This new device, known as the PF - K200, is being designed to monitor and measure engine and compressor frame oil usage."

The oil usage can either be communicated to a PLC or SCADA system by digital pulse signals or displayed on a digital display mounted in the control panel. The pulse meter is approximately 2 x 4 in. (49 x 98 mm) and will indicate the oil consumption in the engine as well as in the compressor frame, he said. Combined with the proflo, an operator will know how much oil is being used by the engine, compressor and divider block lubrication system.

"Everything we do at CCT deals with monitoring oil consumption and protecting compressors and engines," Roys said. His company has been appointed key distributor for Alemite's compressor divider block markets in Mexico, the United States and Canada. Alemite Corp. manufacturers many grease and oil systems products.

"We're excited to have CC Technology as our key distributor of centralized lubrication products in the gas compressor segment," said Shawn King with Alemite Corp., which manufactures lubrication products including replacement divider blocks that retrofit Lubriquip, Lincoln, SB, and Dropsa divider blocks. "CC Technology brings technical expertise to this relationship. Their brand fits in well with the Alemite brand because we complement one another in areas of commitment to quality, customer satisfaction and technology development. We're looking toward a bright future working closely with them."

Roys has sold approximately 1500 original proflo devices. Purchasers include Ariel, Hanover, CSI, Enogex, JW, POI, El Paso Field Services, Duke Energy Field Services, PG&E, ExxonMobil and Red Cedar Gathering in Colorado. CCT has recently opened new markets overseas where Roys said there are many compressor manufacturers and existing compressors that have never had this monitoring capability. ■