CS-APC-22M

Bulletin No.: CS-APC-22M-001

Subject: Prevention of Leaks & Contamination in Syringe Housing

Background

During maintenance activities involving the sample syringe and/or sensor of the instrument, there is a potential risk of introducing fluid leaks. These leaks can allow small quantities of solvent and/or diluted sample to infiltrate the opening in the syringe body. If this occurs, the fluid may accumulate at the bottom of the syringe housing, potentially compromising the operation of the opto-detector PCB located there. The same problem will occur if the syringe plunger seal is worn and during a dispensing cycle allows some fluid to leak past the seal and build up and drip from on the bottom rim of the syringe barrel.

Issue

Fluid contaminants pooling at the base of the syringe housing will eventually lead to the contamination of the opto-detector PCB and cause a syringe drive error. The error will be reported either as error “25 – Syringe Pump Stall” or error “35 – Missing Syringe Pump Encoder” and typically requires the replacement of the opto-detector PCB to restore drive functionality. If the opto-detector board has only been contaminated with oil it is often possible to clean the surface of the black slotted opto-switch on the PCB and restore the required level of optical sensitivity. To clean the opto-switch it should be sprayed with heptane and wiped with a tissue and must never be submerged in the solvent.

Recommended practice

1. **Replace the syringe piston seal in a timely manner.** Include this as an annual PM task.
2. **Monitor sample processing after system maintenance.** Carefully monitor the sample syringe while a sample is being processed to detect and eliminate a system leak following system maintenance.
3. **Prepare a Lint-Free Tissue Pad:** Create a thin layer of lint-free tissue material to serve as a protective pad.
4. **Install the Tissue Pad:** Insert the tissue pad behind the syringe housing. Position it by wedging the pad between the syringe outer housing and the cap at the top of the syringe body, as illustrated in Fig. 1.
5. **Monitor the Tissue Pad:** Regularly inspect the tissue pad for saturation. If the pad becomes saturated with solvent and/or sample this indicates a leak.

Mitigation: The tissue pad not only serves to provide an early leak detection mechanism but also serves as a temporary barrier to prevent fluids flowing into the opening of the syringe body where they can contaminate and damage the opto-detector PCB.

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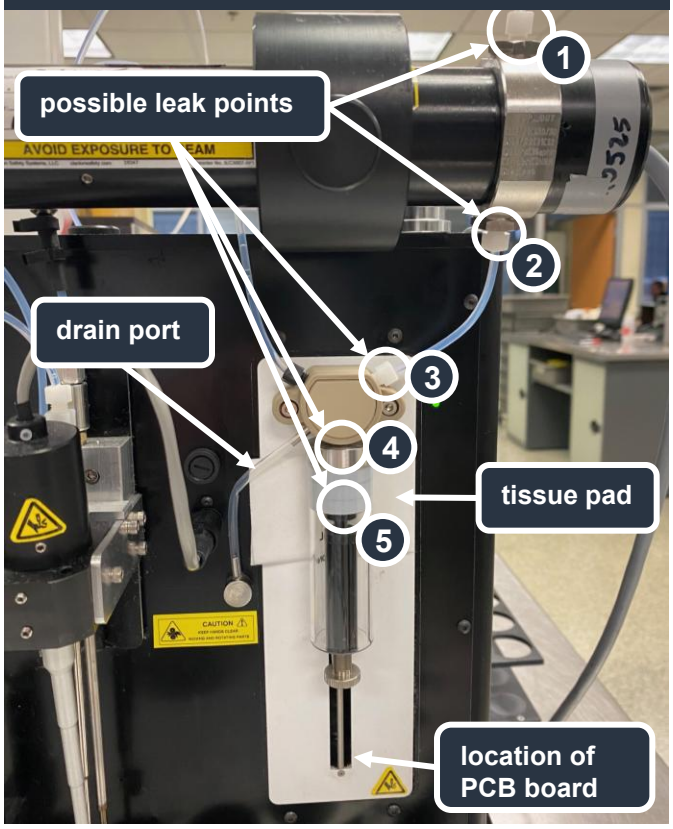
Leak Sources: Leaks occur on the positive pressure side of the sample delivery system and may originate from any of the five (5) locations shown in Figure 1.

Permanent Resolution: After any maintenance activity requiring their removal, ensure all tubes and tube nuts are properly secured in ports from which they were removed and make sure the syringe is firmly screwed into the bottom port of the syringe valve. Regularly inspect the bottom rim of the syringe barrel for signs of a leak and replace the syringe piston seal if a significant fluid build up is detected.

Figure 1 – *Potential leak points on the CS-APC-22M instrument, including (1), (2) and (3) ensure the tubing nuts are well "finger" tightened, (4) ensure the syringe body is well tightened ("finger" tight) into the syringe valve, and (5) replace the syringe seal if it appears worn.*

Figure 1 – Leak points on the CS-APC-22M



Replacement Parts Availability: CINRG has engineered a low-cost piston seal replacement and an opto-detector PCB that is less susceptible to contamination and damage by solvent and oil exposure and is a direct replacement for the standard PCB.

P/N: CS-PPOD-V2
Description: Opto-Detector PCB.

P/N: CS-S25PS
Description: 25 ml syringe piston seal replacement.

These parts are available for purchase through CINRG Systems Inc. technical support or authorized distributors.