

03.103 CDRA Zeolite Filter Regeneration (03. ECLSS)

OBJECTIVE:

To remove trapped CO₂ and H₂O from saturated Zeolite filters for recycle and reuse.

EQUIPMENT:

Zeolite 5A filter (will be gathered during the procedure)

Zeolite 13X filter (will be gathered during the procedure)

Zeolite regeneration unit (will be gathered during the procedure)

PPE safety glasses

PPE Kobalt work gloves

PPE static wrist tether

NOTE

The CO₂ and H₂O from the Zeolite filters will be added to the reactants and products respectively for the Sabatier process as a means to create a closed-loop cycle for cabin air on POLARIS.

GMWS

1. PUT SABATIER IN STANDBY MODE

1.1 Don PPE safety glasses.

1.2 Don PPE Kobalt gloves.

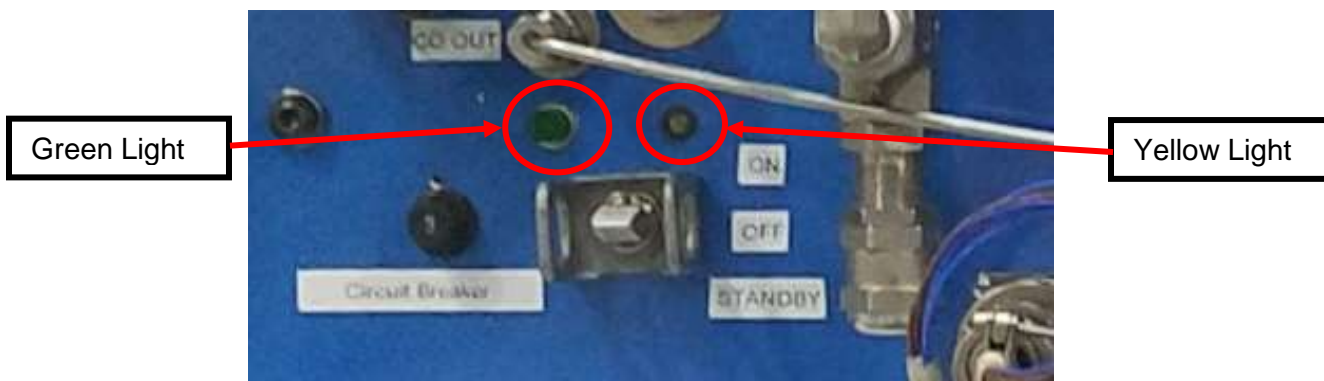


Figure 1: Sabatier Panel

1.3 On the Sabatier Panel, move the power switch to “STANDBY” (see Figure 1).

1.4 Confirm yellow light blinks indicating Sabatier is in Standby mode (see Figure 1).

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GMWS 2. ASSEMBLE ZEOLITE REGENERATION UNIT TO SABATIER

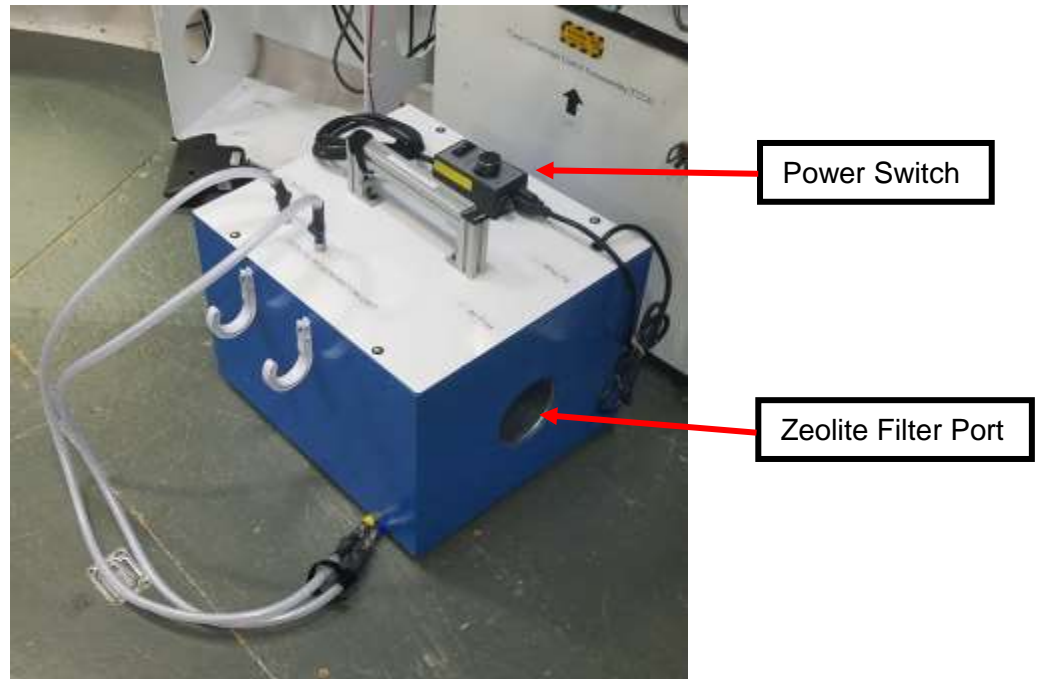


Figure 2: Zeolite Regeneration Unit (ZRU)

- 2.1 Move Zeolite Regeneration Unit (ZRU) in front of Sabatier (see Figure 2).
- 2.2 Don static wrist tether and attach to unpainted metallic surface.
- 2.3 Unfurl the CO₂ (yellow taped) and H₂O (blue taped) hoses and quick disconnects (QDs).
- 2.4 Connect yellow QD to yellow port on Sabatier.
- 2.5 Confirm the yellow QD fully snaps into place by audible click sound and giving the hose a slight tug.
- 2.6 Connect blue QD to blue port on Sabatier.
- 2.7 Confirm the blue QD fully snaps into place by audible click sound and giving the hose a slight tug.

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Figure 3: ZRU Power Switch

- 2.8 Confirm power switch on ZRU is in the “OFF” position (see Figure 3).
- 2.9 Unfurl power cable and plug power cable into outlet strip on right of Sabatier (see Figure 4).
- 2.10 Detach static wrist tether from metallic surface.

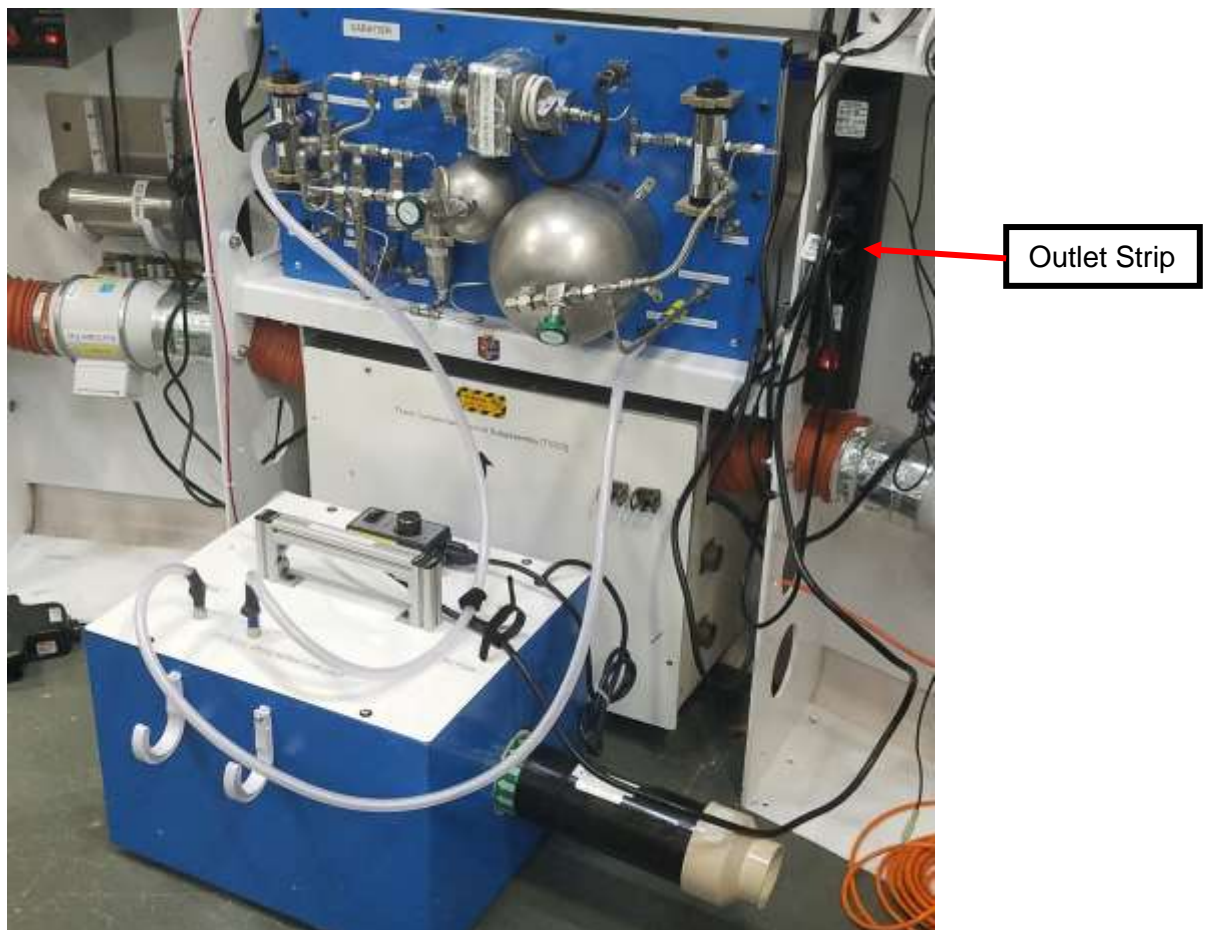


Figure 4: ZRU Connected to Sabatier

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ALC

3. RETRIEVE SATURATED ZEOLITE 5A AND 13X FILTERS

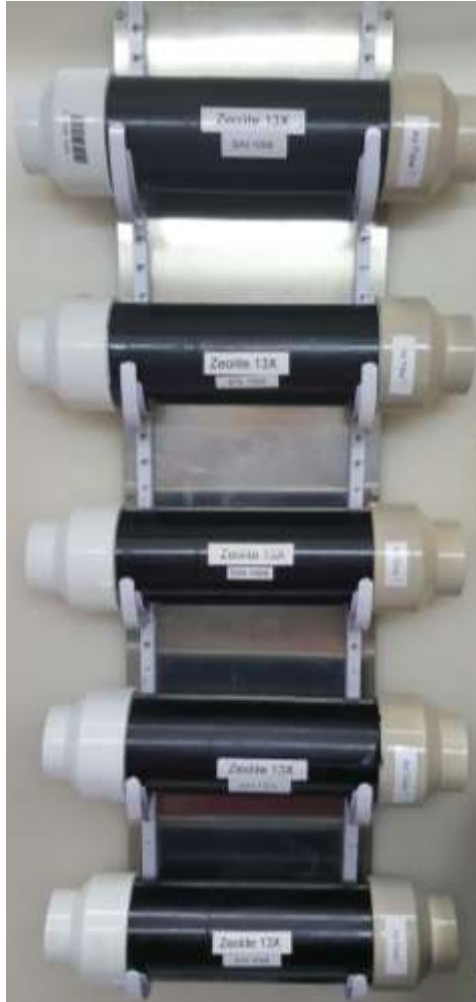


Figure 5: Zeolite Canister Rack

- 3.1 Remove QTY 1 saturated Zeolite 5A filter from rack or consumables drawer in ALC L01.

Refer to MCC on which S/N to remove. .

- 3.2 Remove QTY 1 saturated Zeolite 13X filter from rack or consumable drawer in ALC L01.

Refer to MCC on which S/N to remove. .

GMWS

4. INSERT SATURATED ZEOLITE 5A AND 13X FILTERS INTO ZRU

- 4.1 Attach static wrist tether to unpainted metallic surface.

- 4.2 Temp stow Zeolite 13X filter.

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- 4.3 Insert Zeolite 5A filter into ZRU port (see Figure 2 and Figure 4).
- 4.4 Confirm air flow arrows on Zeolite 5A filter are correct.
- 4.5 Power on ZRU to "FULL" power (see Figure 3).
- 4.6 Detach static wrist tether from metallic surface.
- 4.7 Notify MCC of ZRU power on.
- 4.8 Wait designated time provided by MCC to ensure ZRU removes all adsorbed CO₂ and H₂O.
- 4.9 Attach static wrist tether to unpainted metallic surface.
- 4.10 Power off ZRU (see Figure 3).
- 4.11 Swap Zeolite 5A filter with Zeolite 13X filter.
- 4.12 Confirm air flow arrows on Zeolite 13X filter are correct.
- 4.13 Temp stow Zeolite 5A filter.
- 4.14 Power on ZRU to "FULL" power (see Figure 3).
- 4.15 Detach static wrist tether from metallic surface.
- 4.16 Notify MCC of ZRU power on.
- 4.17 Wait designated time provided by MCC to ensure ZRU removes all adsorbed CO₂ and H₂O.
- 4.18 Attach static wrist tether to unpainted metallic surface.
- 4.19 Power off ZRU (see Figure 3).
- 4.20 Remove ZRU power cable plug from outlet strip to right of Sabatier.
- 4.21 Furl power cord and use Velcro tie to secure.
- 4.22 Disconnect blue QD from Sabatier.
- 4.23 Disconnect yellow QD from Sabatier.
- 4.24 Furl hoses and QDs together around stow hooks and use Velcro tie to secure.
- 4.25 Remove Zeolite 13X filter from ZRU.
- 4.26 Doff static wrist tether.

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ALC 5. RETURN RECYCLED ZEOLITE FILTERS TO AIRLOCK

5.1 Attach recycled Zeolite 5A filter to Zeolite Rack located on Airlock Module Wall C.

5.2 Attach recycled Zeolite 13X filter to Zeolite Rack located on Airlock Module Wall C.

GMWS 6. RETURN SABATIER TO ON CONFIGURATION

6.1 Switch Sabatier to "ON" (see Figure 1).

6.2 Confirm green light illuminates indicating Sabatier is in On mode.

6.3 Doff all PPE and stow.