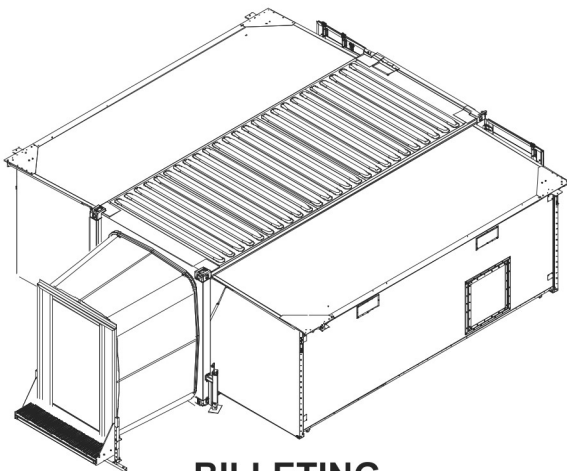


**TECHNICAL MANUAL**

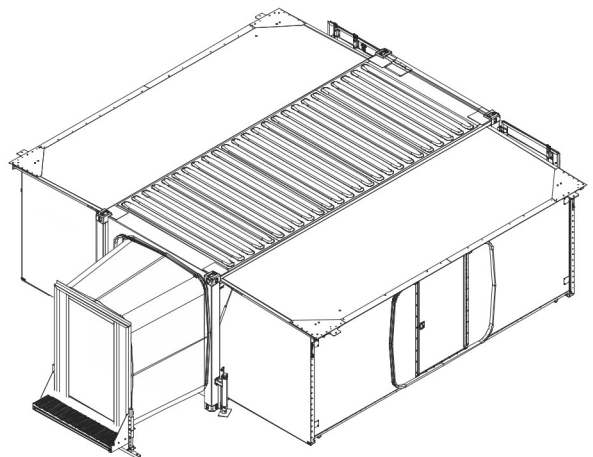
**OPERATOR AND FIELD MAINTENANCE MANUAL**

**INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST  
FOR**

**SHELTER, EXPANDABLE  
BILLETING, GREEN (NSN 5411-01-653-4334)  
SHELTER, EXPANDABLE  
BILLETING, TAN (NSN 5411-01-653-4350)  
SHELTER, EXPANDABLE  
ADMINISTRATION, GREEN (NSN 5411-01-669-9290)  
SHELTER, EXPANDABLE  
ADMINISTRATION, TAN (NSN 5411-01-669-9286)**



**BILLETING**



**ADMINISTRATION**

**DISTRIBUTION STATEMENT A** – Approved for public release, distribution is unlimited.

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**HEADQUARTERS, DEPARTMENT OF THE ARMY**

**21 JANUARY 2019**

## WARNING SUMMARY

This warning summary contains general safety warnings and hazardous materials warnings that must be understood and applied during operation and maintenance of the Energy Efficient Rigid Wall Module (E2RWM) Administration and Billeting shelters. Failure to observe these precautions may result in serious injury or death to personnel. Also included are explanations of safety and hazardous materials icons used within this technical manual.

### First Aid

For First Aid treatment, refer to TC 4-02.1.

### Explanation of Safety Warning Icons



**EAR PROTECTION** – Headphones over ears show that noise level will harm ears.



**ELECTRICAL** – Electrical wire to arm with electricity symbol running through human body shows that shock hazard is present.



**FALLING PARTS** – Arrow bouncing off human shoulder and head shows that falling parts present a danger to life or limb.



**HEAVY OBJECT** – Human figure stooping over heavy object shows physical injury potential from improper lifting technique.



**HEAVY PARTS** – Heavy object on human figure shows that heavy parts present a danger to life or limb.



**HEAVY PARTS** – Foot with heavy object on top shows that heavy parts can crush and harm.



**HEAVY PARTS** – Heavy object pinning human figure against wall shows that heavy, moving parts present a danger to life or limb.



**HOT AREA** – Hand over object radiating heat shows that part is hot and can burn.



**MOVING PARTS** – Hand with fingers caught between gears shows that the moving parts of the equipment present a danger to life or limb.



**SHARP OBJECT** – Pointed object in hand shows that a sharp object presents a danger to limb.

## WARNING SUMMARY – CONTINUED



**SLICK FLOOR** – Wavy line on floor with legs prone shows that slick floor presents a danger for falling.

### General Safety Warnings Descriptions

#### WARNING



Do not block any personnel door or alternate egress door, whether inside or outside the system. The door may be the only available exit in case of an emergency. Failure to observe this warning may result in personal injury or death to personnel. If injury occurs, seek immediate medical attention.

#### WARNING



The Shelter, Expandable (Billeting) and Shelter, Expandable (Administration) electrical systems must be properly grounded. Failure to ground the shelter may result in serious injury or death to personnel.

High voltage is present. Follow all electrical safety precautions when performing maintenance. Failure to comply may result in serious injury or death to personnel. If exposed to electricity seek immediate medical attention.

Remove all jewelry before starting work. Metal objects such as rings or tools can cause short circuits. Do not allow tools to contact live circuits. A direct short can cause instant heating of tools resulting in personal burns or death and equipment damage. Failure to comply may result in serious injury or death to personnel. If exposed to electricity, seek immediate medical attention.

#### WARNING



The Shelter, Expandable (Billeting) and Shelter, Expandable (Administration) containers are very heavy. Only use material handling equipment such as a forklift, crane, or RTCH or other suitable lifting devices of proper configuration and sufficient capacity to lift, move and position the container. Each container's packed weight is stenciled on its cargo door.

The air conditioner weighs 230 lbs. Lift and move the air conditioner only with material handling equipment. Observe all safety precautions. Never stand under the air conditioner when it is being moved or lifted. Failure to comply may result in serious injury or death to personnel. If injury occurs, seek immediate medical attention.

Roofs, floors, and sidewalls are heavy. To prevent injury, observe requirements regarding team lifting and minimum number of personnel required. Always practice proper lifting techniques to avoid personal injury or damage to equipment. If injury occurs, seek immediate medical attention.

## WARNING SUMMARY – CONTINUED

### WARNING



Some shelter equipment and packed items are heavy. Observe requirements regarding team lifting and minimum number of personnel required. Always practice proper lifting techniques to avoid personal injury or damage to equipment. If injury occurs, seek immediate medical attention.

### WARNING



The bunk bed lids (Billeting only), adjustable door closer arm, 18K E2CU slide, and winch assembly are pinch points. Use extreme caution when handling these items to avoid pinching of fingers. Failure to observe safety precautions may result in injury to personnel. If injury occurs, seek immediate medical attention.

### WARNING



When performing maintenance procedures on the mechanical wall heater, ensure it has cooled down before proceeding. Failure to observe safety precautions may result in injury to personnel.

### WARNING



The window panes on the side walls (Billeting only) and fan blades in the mechanical wall heater have sharp edges. Wear protective gloves. When replacing the window pane or working on the mechanical wall heater, use extreme caution, observe all warnings, and follow safety procedures. Failure to observe safety precautions may result in injury to personnel. If injury occurs, seek immediate medical attention.

### WARNING



Use caution when entering or exiting the access door, side doors (Administration only), or egress door (Billeting only). Failure to observe safety precautions may result in injury to personnel. If injury occurs, seek immediate medical attention.

When accessing the roof of the container, always maintain a three-point (two hands and a foot, or two feet and a hand) contact on ladder when climbing. Position body near the middle of the step and always face the ladder while climbing. Failure to observe safety precautions may result in injury to personnel. Seek immediate medical attention if injury occurs.

**WARNING SUMMARY – CONTINUED****WARNING**

Continuous exposure to the high sound level of the smoke alarm over an extended period of time may cause hearing loss. If the smoke alarm is sounding, use ear plugs during maintenance. Failure to observe safety precautions may result in injury to personnel. If injury occurs, seek immediate medical attention.

**WARNING**

Wear safety goggles to protect eyes, ear protection to protect ears, and gloves to protect hands when drilling out rivets. Do not use excessive force while drilling. Failure to comply may result in serious injury to personnel. If injury occurs, seek immediate medical attention.

**Explanation Of Hazardous Materials Icons**

**CHEMICAL** – Drops of liquid on hand shows that the material will cause burns or irritation to human skin or tissue.



**EYE PROTECTION** – Person with goggles shows that the material will injure the eyes.



**FIRE** – Flame shows that a material may ignite and cause burns.



**POISON** – Skull and crossbones shows that a material is poisonous or is a danger to life.



**VAPOR** – Human figure in a cloud shows that material vapors present a danger to life or health.

**General Hazardous Material Warning Descriptions****WARNING**

**Smoke / Carbon Monoxide**

## **WARNING SUMMARY – CONTINUED**

Carbon Monoxide (CO) is a colorless, odorless gas that is toxic. The administration or billeting shelters must not be operated without a functional CO / smoke detector. Failure to comply may result in serious injury or death to personnel.

## OPERATOR

## DESCRIPTION AND USE OF OPERATOR CONTROLS AND INDICATORS

## INTRODUCTION

This work package provides the descriptions and locations of the Shelter, Expandable (Billeting) and Shelter Expandable (Administration) controls and indicators. Personnel operating and maintaining the Shelter, Expandable (Billeting) and Shelter Expandable (Administration) should know the location and proper use of every control and indicator.

## SHELTER, EXPANDABLE (BILLETING) AND SHELTER, EXPANDABLE (ADMINISTRATION)

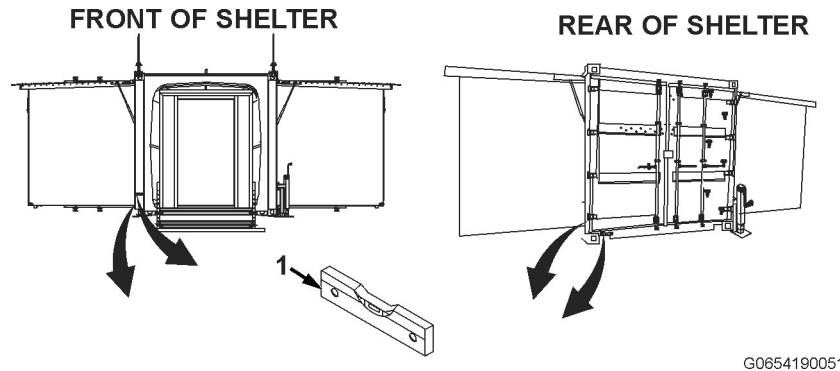


Figure 1. Bubble Level.

Table 1. Bubble Level

| Key | Control/Indicator | Function   |
|-----|-------------------|--|
| 1   | Bubble Level      | Bubble indicator will be centered if shelter is level. |

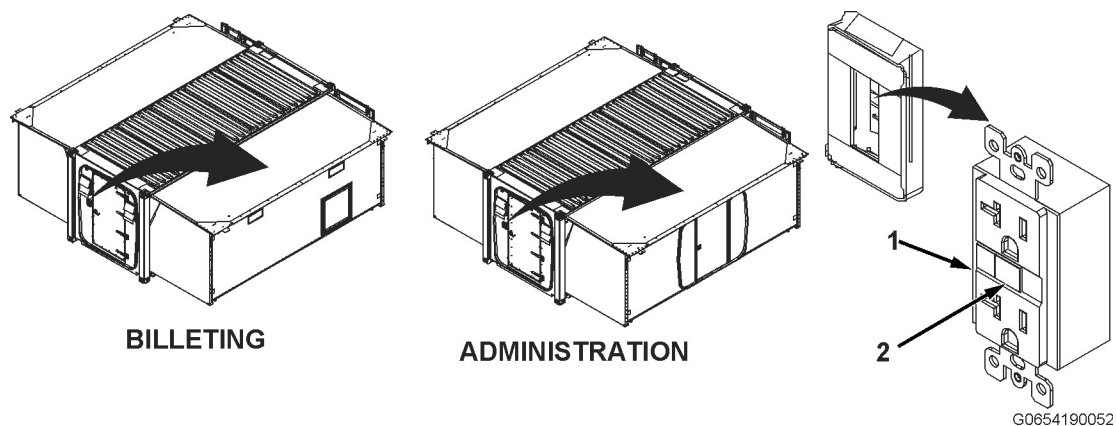


Figure 2. 20-Amp GFCI Receptacle at Front Door.

Table 2. 20-Amp GFCI Receptacle At Front Door

| Key | Control/Indicator | Function                                       |
|-----|-------------------|--|
| 1   | Test Button       | Push TEST button and RESET button should trip. |
| 2   | Reset Button      | Push RESET button after pushing TEST button.   |

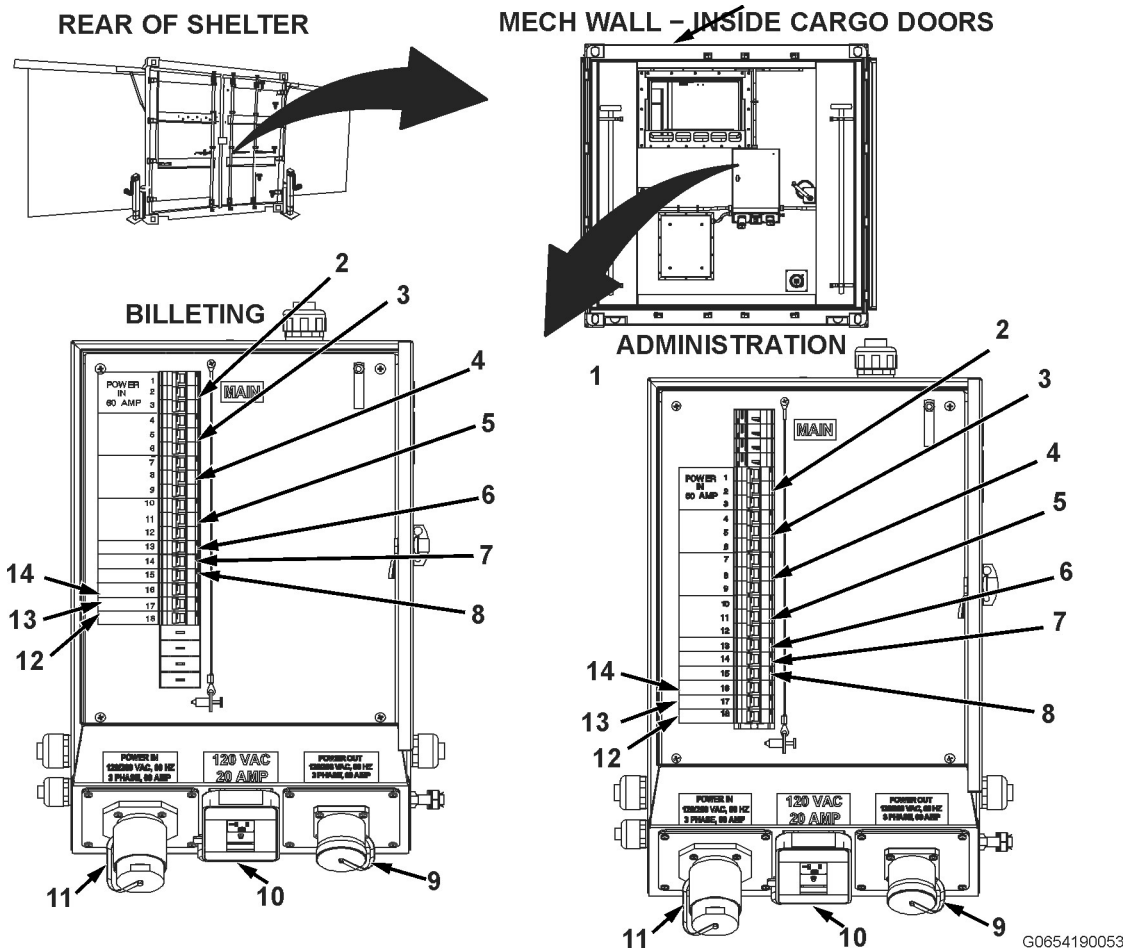


Figure 3. Power Panel Assembly.

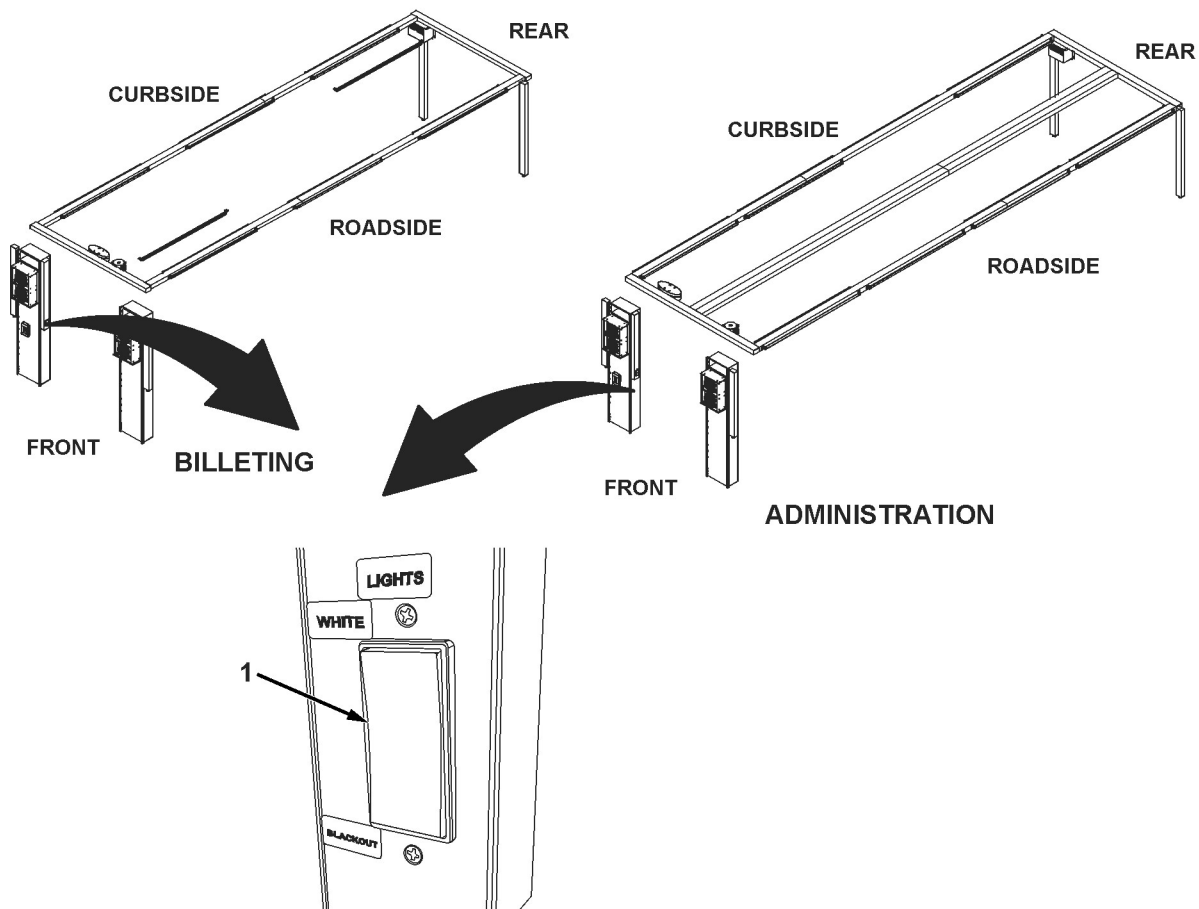
Table 3. Power Panel Assembly

| Key | Control/Indicator                     | Function  |
|-----|---------------------------------------|---|
| 1   | Surge Protector (Administration Only) | Protects electrical devices from voltage spikes.  |
| 2   | Circuit Breaker 1-3                   | Controls electric current to Power In. Indicator will show red when "hot" and green when tripped.                     |
| 3   | Circuit Breaker 4-6                   | Controls electric current to Power Out. Indicator will show red when "hot" and green when off or tripped.             |
| 4   | Circuit Breaker 7-9                   | Controls electric current to ECU. Indicator will show red when "hot" and green when off or tripped.                   |
| 5   | Circuit Breaker 10-12                 | Controls electric current to Heater. Indicator will show red when "hot" and green when off or tripped.                |
| 6   | Circuit Breaker 13                    | Controls electric current to Right Door. Indicator will show red when "hot" and green when off or tripped.            |
| 7   | Circuit Breaker 14                    | Controls electric current to Left Door. Indicator will show red when "hot" and green when off or tripped.             |
| 8   | Circuit Breaker 15                    | Controls electric current to right mechanical wall. Indicator will show red when "hot" and green when off or tripped. |
| 9   | Power Out Connector                   | Power out is used if connecting several shelters together.  |



| Key | Control/Indicator                                | Function  |
|-----|--|---|
| 10  | Receptacle, Electrical<br>(Power Panel Assembly) | GFCI outlet.  |
| 11  | Power In Connector                               | Main power to system.   |
| 12  | Circuit Breaker 18                               | Controls electric current to lights. Indicator will show red when "hot" and green when off or tripped.                    |
| 13  | Circuit Breaker 17                               | Controls electric current to front door waterfall GFCI. Indicator will show red when "hot" and green when off or tripped. |
| 14  | Circuit Breaker 16                               | Controls electric current to left mechanical wall. Indicator will show red when "hot" and green when off or tripped.      |

## INTERIOR VIEW – CEILING



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Figure 4. Light Switch.

Table 4. Light Switch

| Key | Control/Indicator | Function   |
|-----|-------------------|--|
| 1   | Light Switch      | Turns lights on and off. Push top of switch for white lights, bottom of switch for blackout lights, and middle of switch is off. |

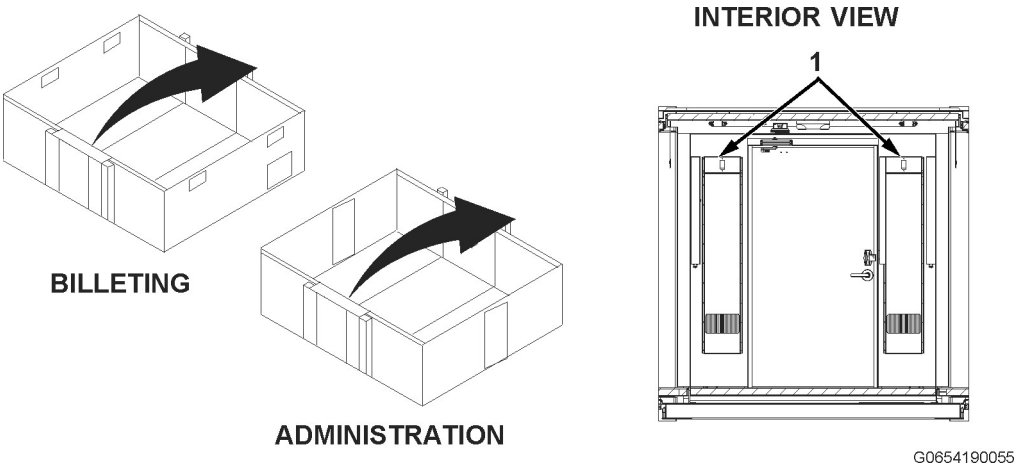
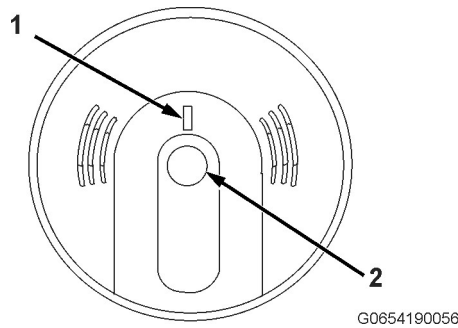


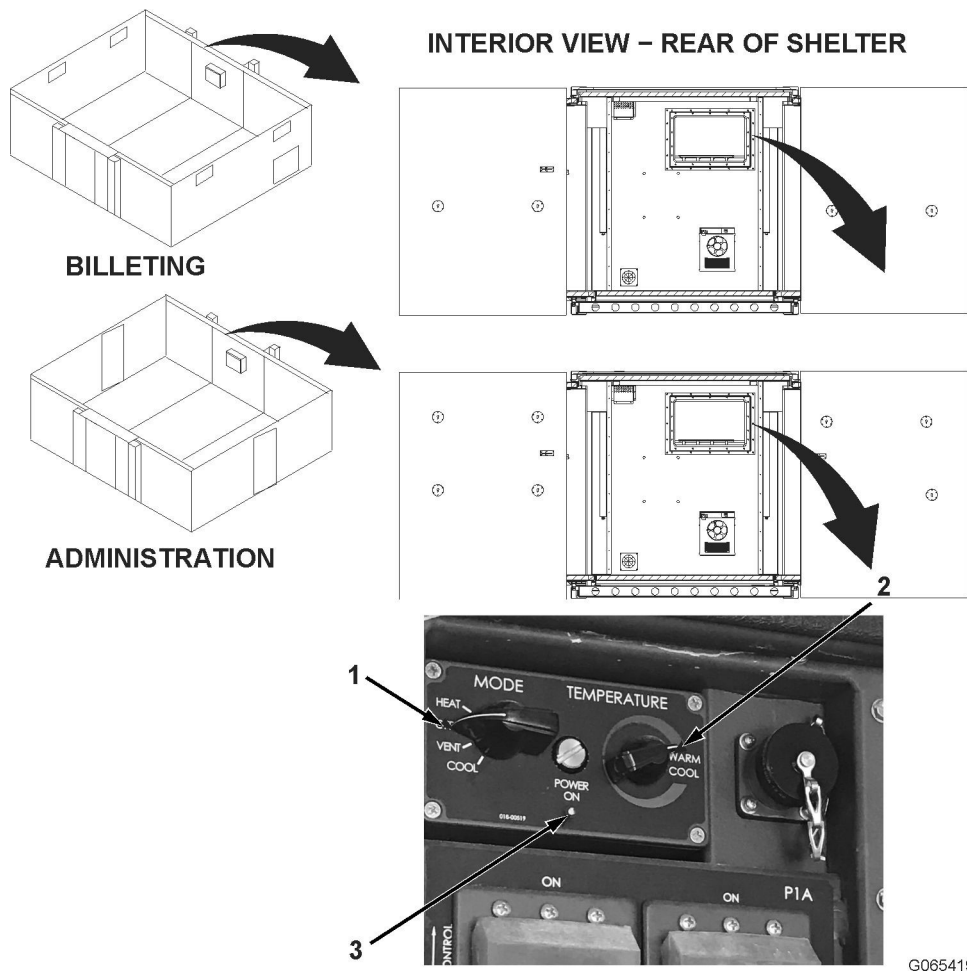
Figure 5. Heat Exchanger Fan (Interior Door Hinge Side and Interior Door Handle Side).

Table 5. Heat Exchanger Fan (Interior Door Hinge Side And Interior Door Handle Side)

| Key | Control/Indicator | Function                           |
|-----|-------------------|------------------------------------|
| 1   | Slide Switch      | On/Off Switch, Controls fan speed. |

**Figure 6. Smoke Alarm.****Table 6. Smoke Alarm**

| Key | Control/Indicator  | Function   |
|-----|--|--|
| 1   | Indicator Light<br>(Figure 6, Item 1)  | Red LED indicates alarm mode; Green LED indicates AC power is present.   |
| 2   | Test/Reset Button<br>(Figure 6, Item 2)                                      | Test the unit's electronics and resets the unit during alarm state.  |
| 3   | Three long "beeps",<br>followed by "FIRE! FIRE!"                             | Indication of fire hazard.   |
| 4   | Four short "beeps",<br>followed by "WARNING!<br>CARBON MONOXIDE."            | Indication of CO hazard.   |
| 5   | One "chirp" every 60<br>seconds, followed by "LOW<br>BATTERY"                | Indication of low battery.   |
| 6   | Unit announces<br>"CO PREVIOUSLY<br>DETECTED" after<br>operating test button | Indication of previous levels of CO exceeding 100ppm.  |
| 7   | One "chirp" every 30<br>seconds prior to "replace<br>by" date                | Indication of alarm malfunction.   |
| 8   | Two "chirps" every 30<br>seconds after "replace by"<br>date                  | Indication that it is time to replace the alarm. REPLACE IMMEDIATELY!<br>ALARM WILL NOT DETECT CO IN THIS CONDITION. |
| 9   | Constant green LED<br>(Figure 6, Item 1)                                     | Indication that AC power is connected.   |
| 10  | Green LED blinks 1 time<br>every second                                      | Indication that unit has initiated an alarm.   |
| 11  | Green LED blinks 1 time<br>every 2 seconds                                   | Indication that unit is in HUSH mode.  |
| 12  | Green LED blinks 1 time<br>every 60 seconds                                  | Indication that unit is powered by battery only.   |
| 13  | Green LED blinks 1 time<br>every 16 seconds                                  | Indication of a previous alarm   |

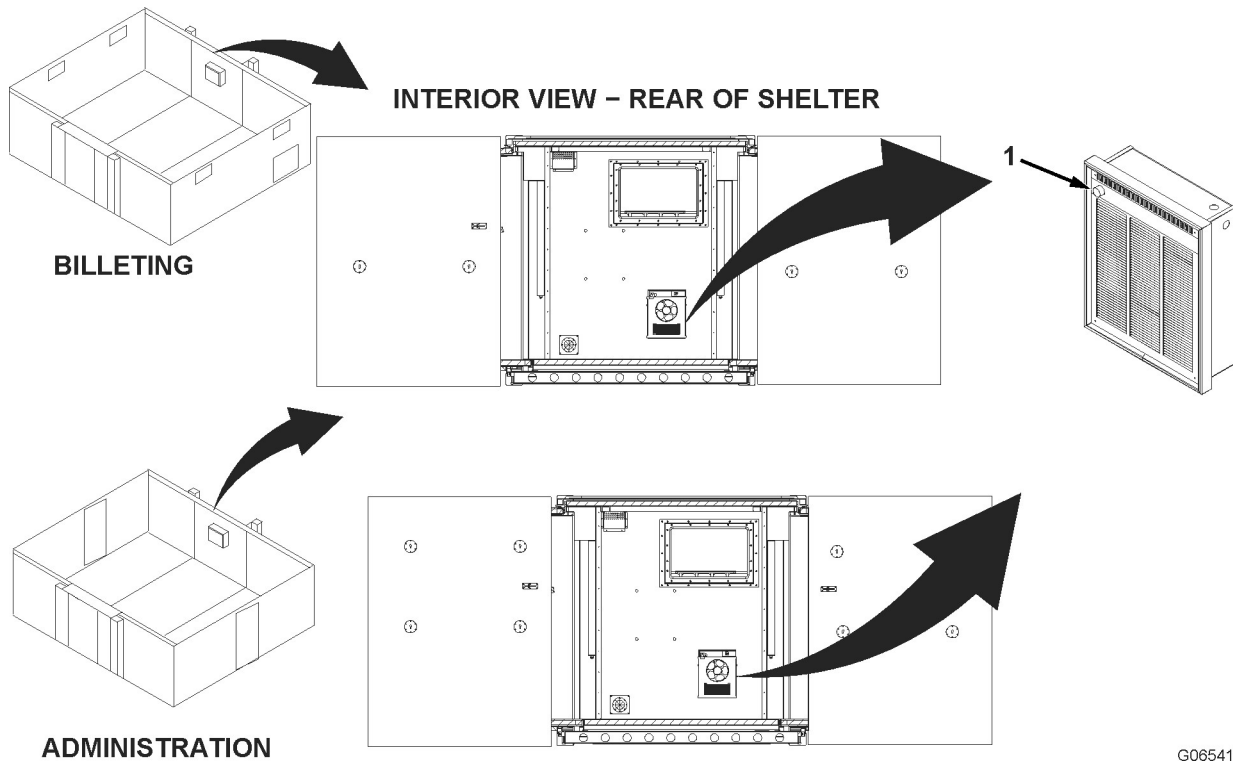


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Figure 7. 18K E2CU.

Table 7. 18K E2CU

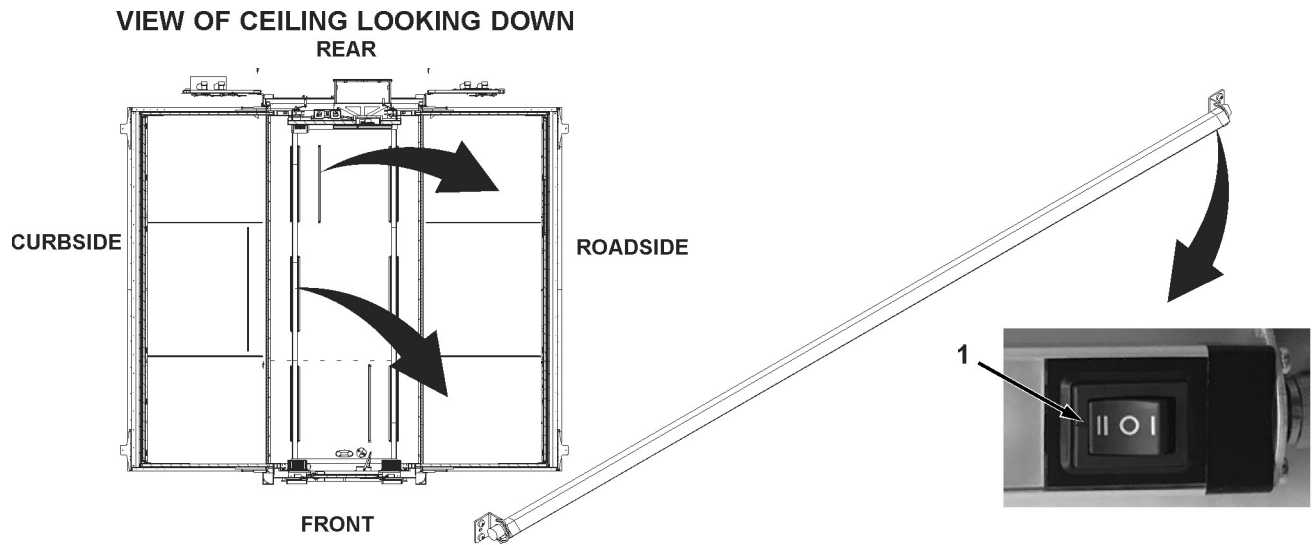
| Key | Control/Indicator  | Function                             |
|-----|--------------------|--------------------------------------|
| 1   | Mode Switch        | Four modes: Heat, Off, Vent, Cool.   |
| 2   | Temperature Switch | Controls variations of Heat and Cool |
| 3   | Power On Indicator | Illuminates green when power is on.  |



**Figure 8. Heater, Mechanical Wall.**

**Table 8. Heater, Mechanical Wall**

| Key | Control/Indicator | Function                    |
|-----|-------------------|-----------------------------|
| 1   | Heater Knob       | On/Off, Controls fan speed. |



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**Figure 9. LED Lights (White) (Billeting Only).**

**Table 9. LED Lights (White) (Billeting Only)**

| Key | Control/Indicator | Function                                |
|-----|-------------------|---|
| 1   | On/Off/High       | Settings control each individual light. |

**END OF WORK PACKAGE**