

# INSTALLATION, OPERATION & MAINTENANCE

**CRFF SERIES  
WALL CONTROL CONSOLE**  
ACC1-125 (271668-002)

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EC MOTORS

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## SAFETY PRECAUTIONS



**Please read and save the following important safety information regarding the ACC1-125 prior to unit operation.**

**To reduce the risk of fire, electrical shock or injury to persons, observe the following:**

- Installation work and electrical wiring for the Control Console and other clean system equipment must be done by a qualified person(s) in accordance with all applicable codes and standards, including fire-rated construction.
- When cutting or drilling into a wall or ceiling, do not damage electrical wiring or other hidden utilities.
- Service to the Control Console cannot be performed in the field. Returned equipment still under warranty to Krueger.
- Before trying to remove the Control Console from the clean system it controls, switch power off for the entire clean system at service panel and lock service panel to prevent power from being switched on accidentally, and follow proper procedures as necessary.
- Use this unit only in the manner intended by the manufacturer. If you have questions, please contact Krueger.

## OVERVIEW

The Krueger Control Console combines intelligent speed control with industry standard MODBUS® networking. The versatile design allows control of an array of Krueger fan filter units with the installed universal control cards.

The console combines a user interface with MODBUS master capability so no additional networking components are needed and no MODBUS knowledge is necessary to install a network. Once the console has automatically scanned the network, only a few simple configuration selections are required.

## CONTROL CONSOLE MODELS

KRUEGER SERIES CONTROL CONSOLE		
MODEL NO.	ADDRESSES	NO. OF CRFF-E UNITS
ACC1-125	125	UP TO 125

## MAIN FUNCTIONS

- Individual address speed adjustment.
- Global address speed adjustment.
- Global address set-back speed adjustment.

## STANDARD FEATURES

- Control and monitor up to 125 FFUs
- Adjusts and displays setpoint and unit status
- Individual and global commands
- Self-configuring upon power up, plug and play
- Central monitoring of fault sensors
  - Pressure drop on AC FFUs
  - RPM drop on EC FFUs

## BENEFITS

- Quick and easy system air balancing of Krueger Fan Filter Units.
- Global standby feature for energy savings.
- Simple set-up and wall-mount Control Console installation.

## SPECIFICATIONS

- 7-segment LED display
- Dual rotary encoders for selection and adjustment
- Power supply provided
  - Supply voltage: 8-13Vdc
  - Typical supply current: 90mA
- Electrical Connections
  - DC Power Connector: 2.1mm DC power jack
  - RJ45 socket for MODBUS network
- No installer configuration required.

## SPECIFICATIONS (CONTINUED)

### ELECTRICAL SPECIFICATIONS

- Supply Voltage: 8-13Vdc
- Typical Supply Current: 90 mA
- Network Transceivers: 2-wire, 1/8 Unit Load Type
- Operating Temperature: 0-40° Celsius (32-104°F) DC
- Power Connector: 2.1 mm DC Power Jack MODBUS
- Network: RJ45 Socket

### Elevation and Dimensions

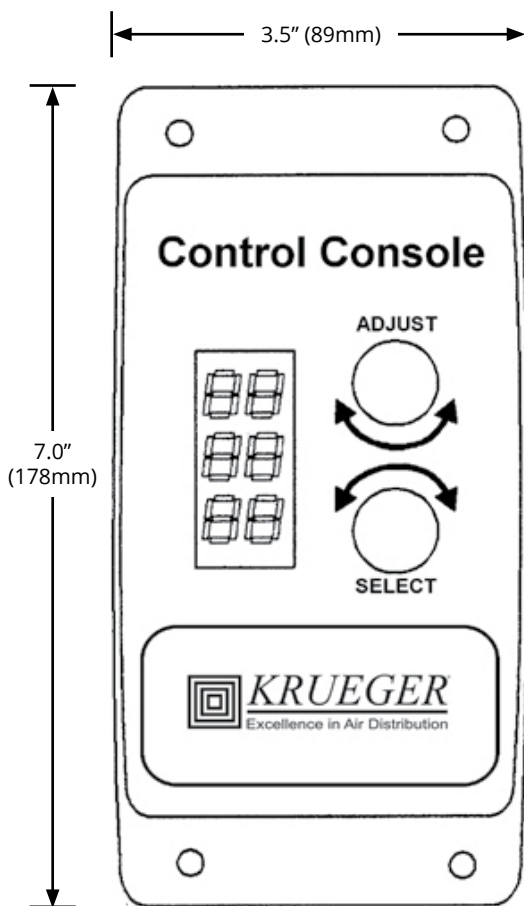


Figure 1: Control Panel

## INSTALLATION

### ELECTRICAL SPECIFICATIONS



**The Krueger Control Systems are engineered for easy installation. However, testing either before permanent installation or as the system is installed is strongly recommended.**

The Control Console can be wall installed in the cleanroom or at a remote location; however, the maximum recommended distance from the beginning to the end of the daisy chain should not exceed 800 linear feet.

### NETWORK WIRING

**Cabling shall be provided and installed by others.** Plenum rated CAT5 cabling is recommended and network cable requirements should be specified based on the following.

A network is constructed by simply daisy-chaining Krueger fan filter units via the universal control card of each fan filter unit. Specific network wiring information can be found in the Krueger CRFF-E operation manuals.

### Network cable requirements should be based on:

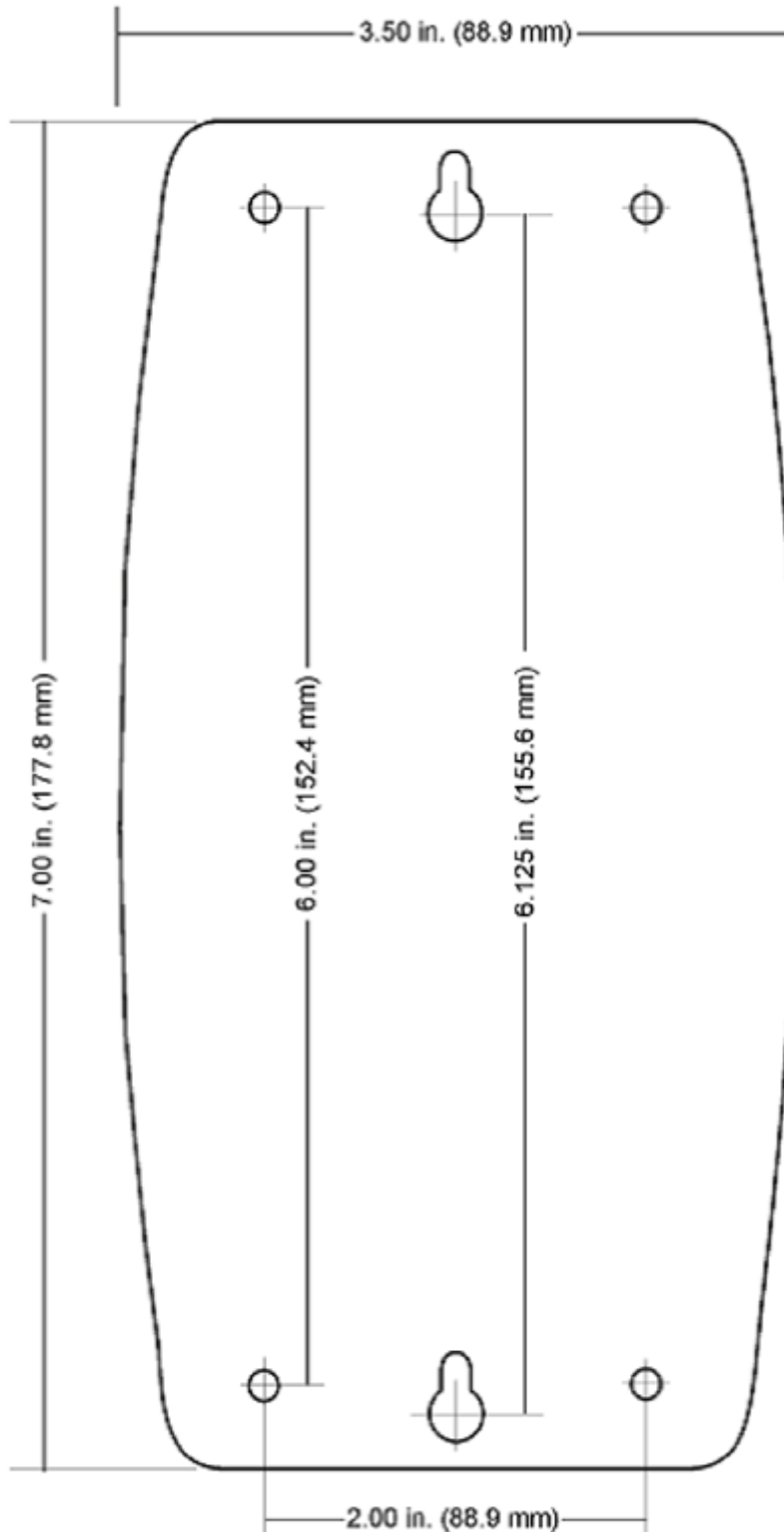
- Distance Between Nodes
- Total Network Length
- Noisy Electrical Environment
- Environmental Conditions
- Mechanical Issues

Once the Control Console has been connected to at least one fan filter unit, power can be applied. The Control Console will automatically scan the network.

Each fan filter unit should be given a unique address within the Control Console's available address range (determined by model number.) The addresses do not need to be contiguous, but contiguous addressing will make operator functions easier.

**INSTALLATION (CONTINUED)**

**CONTROL CONSOLE INSTALLATION TEMPLATE**



## INSTALLATION (CONTINUED)

### CONTROL CONSOLE POWER CONNECTIONS

The control console can be powered a plug-in style wall adapter, or a dedicated circuit board.

1. Plug in wall adapter: P/N: 64114-001
2. Dedicated circuit board: P/N: 63973

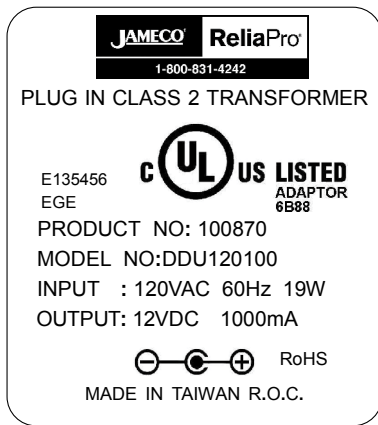


Figure 2: Unit Label

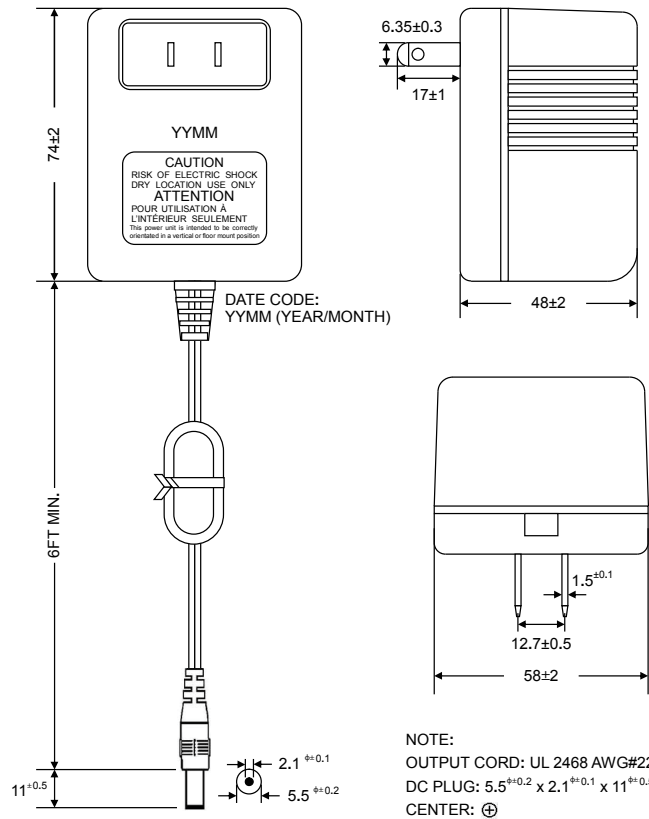
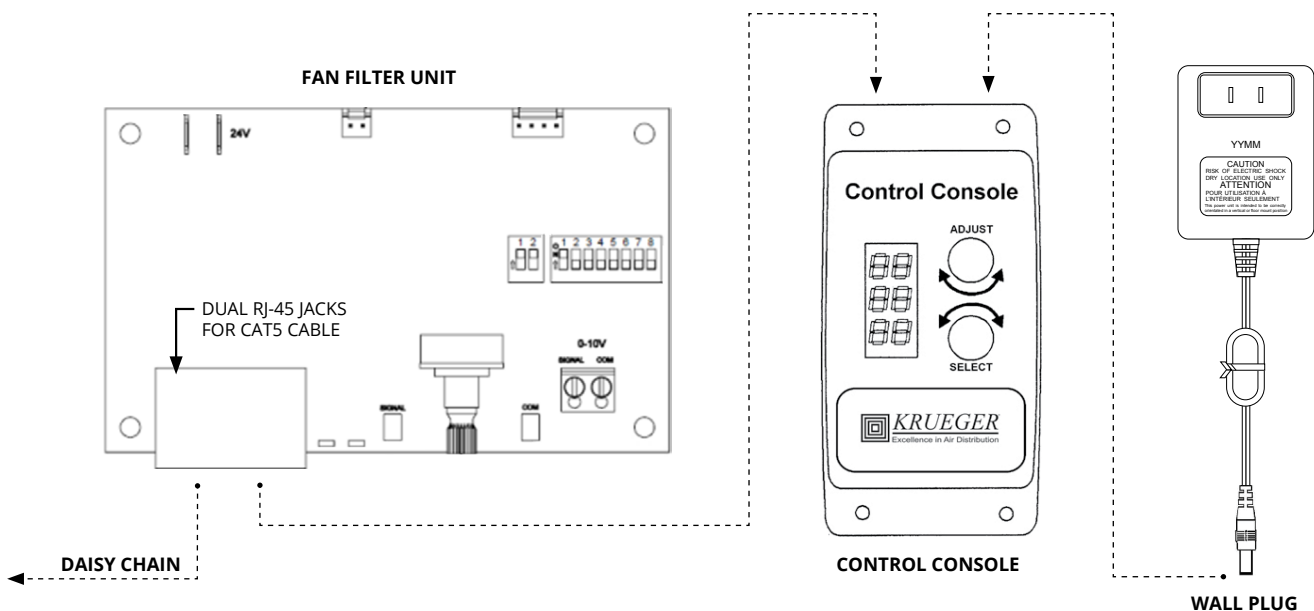


Figure 3: Wall Plug Dimensional Information



Control Connections

## INSTALLATION (CONTINUED)

### SPECIFICATION

- Output: 12VDC at 1 Amp
- AC Input Range: 14-28VAC
- DC Input Range: 18-40VDC
- Fault Protected
- Short-Circuit Protected
- Internally Current-Limited to 1.2A Installation
- LED Power Indication
- Simple Connections
- RJ45 for network
- ¼ " Quick Connect for Transformer
- Open-frame PCB with Standoffs
- 0-40°C Operating Temperature
- Surge Protection for Power and Data Lines
- Dimensions: 2.20" x 3.00" x 1.45" (56 x 76.3 x 36.90 mm)

The ACM1008 should be used with a transformer which is suitable for the environment and end application. Transformers smaller than 12VA can be used provided that the 1 Amp load is reduced proportionally. Check the jumpers behind the RJ45 connectors to be sure power is going to the proper cable direction. Remove (flag) the 0.1" jumper by the port you want to disable power (where there is more than one ACM1008, ensure that each cable segment has only one power source).

The Green LED on each port connector will illuminate when power is applied. If it does not, check for shorts in the CAT5 cabling and measure the 24VAC input power.

The 0V power connection is normally linked to the mounting posts for grounding. Cut JP3 to isolate the 0V power connection from ground. This may be necessary to eliminate ground-loop currents in some installations where multiple power supplies are used.

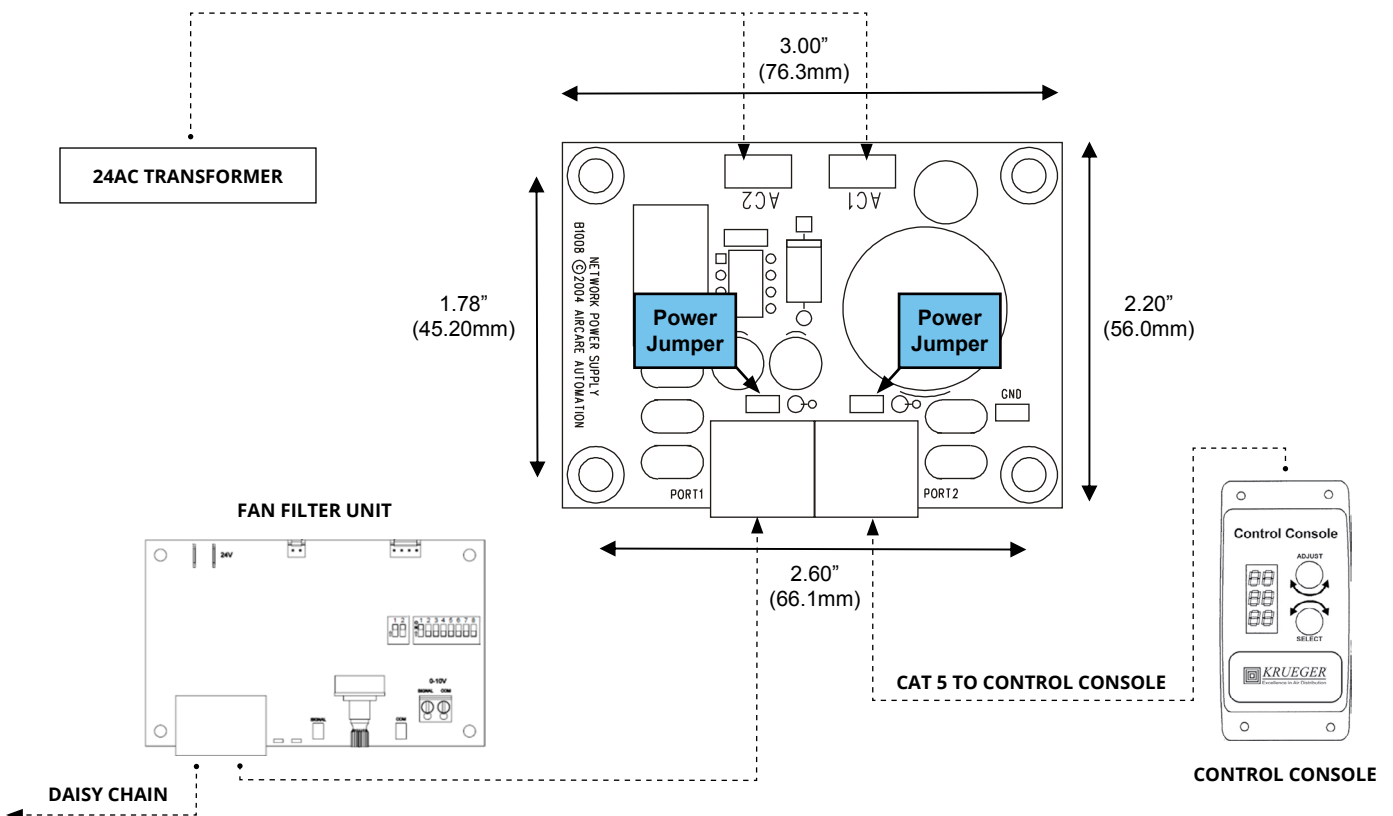


Figure 4: ACM1008 Jumpers

## CONTROL CONSOLE OPERATION

### FRONT PANEL FEATURES

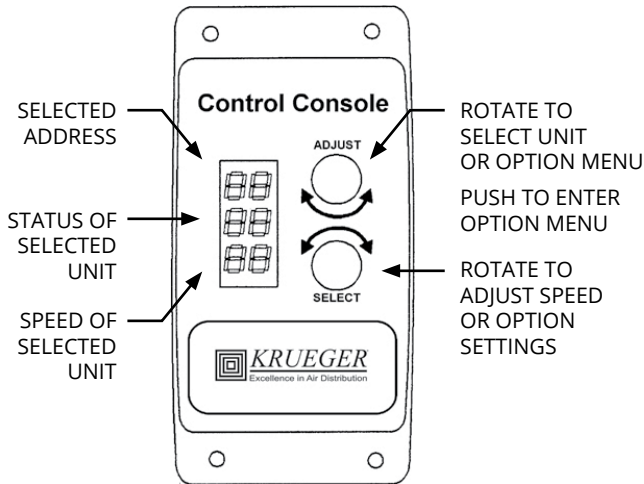


Figure 5: Panel Features

### POWER ON

At power-on, the Control Console displays a series of parameters including model number on the three LED displays for about one second. The Control Console then cycles all segments in display to confirm that the display is functional. Once display cycling is complete, the Control Console then scans all addresses valid for that model (10, 25 or 50.)

If no fan filter unit is detected, the Control Console repeats the scan sequence until at least one unit is found.

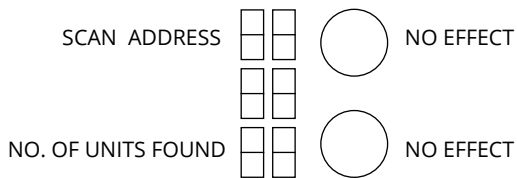


Figure 6: Front Panel Functions During Power-On

### STANDBY MONITOR MODE

The Control Console immediately enters standby monitor mode at the conclusion of power-on scanning. The Control Console remains in standby monitor mode until one of the two dials are rotated. If the dials are not adjusted for a period of 30 seconds, the Control Console will revert to standby monitor mode.

In standby monitor mode, the Control Console repeatedly polls all units detected during power-on scanning. Unused motor addresses are skipped, but the highest address must be within range of the Control Console model settings (10, 25 or 50.)

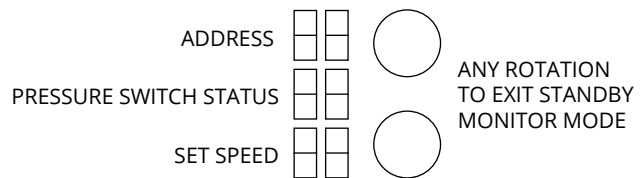


Figure 7: Standby Monitor Mode Front Panel Functions

The Control Console polls each fan filter unit while displaying status information on each unit for about 2 seconds. The following information is displayed:

#### MODBUS Address of Unit Monitored (Top LED)

#### Pressure Switch Status

- "PG" for Pressure Good.
- "PF" for Pressure Fault.
- If Pressure Switches are not enabled, the display will be blank.
- If the control console is in Low Speed Mode, then "LO" will be displayed instead of the pressure switch status.

#### Set Speed or Blank Display (Center LED)

- Displays set speed in percent.
- This value is read from MODBUS register 2.

Note: If no response is received, the middle and lower LED shall display "--".



## CONTROL CONSOLE OPERATION (CONTINUED)

### USER MONITOR MODE

If any dial activity is detected, the Control Console leaves standby monitor mode and enters user monitor mode. In this mode, any unit can be selected by rotating the Select dial.

*Note: If the Select dial is moved past the valid address range, the select display shows "OP." Pushing the Select dial enters the Option Menu.*

### USER ADJUST MODE

This mode is identical to User Monitor mode, except that the set speed of any motor can be adjusted.

If the Select dial is moved below the valid address range, the select display shows "OP". The current access level is also displayed. Pushing the Select dial enters the Option Menu.

The Control Console writes the set speed as a percentage of the maximum speed (0-99 %). If power fails, each Digital Speed Controller will run at the most recent speed selected.

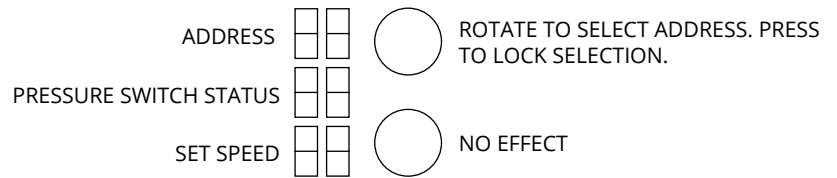


Figure 8: User Monitor Mode Front Panel Functions

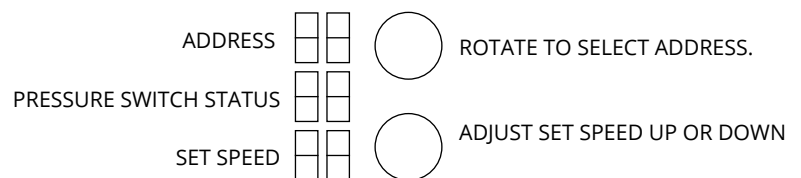


Figure 9: User Adjust Mode Front Panel Functions

## CONTROL CONSOLE OPERATION (CONTINUED)

### OPTION MENU

The option menu allows a user to perform the following functions:

- Change the access level by entering pass codes. (A1...A3)
- Select High Speed (normal) or Low Speed. (Global set back)
- Adjust the Low Speed set back.
- Select whether pressure switches are present or not.
- Set the speed for every node simultaneously.

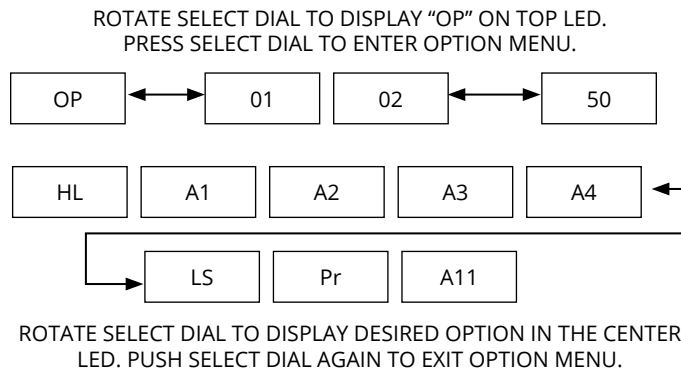


Figure 10: Option Menu Navigation

#### Access Levels

- Use the Select Dial to display the new access level requested.
- Press the Select Dial.
- If the new level has fewer privileges, then no pass code is needed. The bottom LED will scroll through its seven LED segments to confirm the change.
- If a pass-code is needed, enter the two-number code on the Adjust Dial. Press the Adjust Dial to lock in the code.
- If the pass-code is correct, the bottom LED will scroll through its seven LED segments.

#### Selecting High or Low Speed (HL)

- This action requires access levels A1-A3.
- Rotate the Select dial to display "HL" in the center LED and press Select dial to lock in this option.
- Rotate the Adjust dial to select "HI" or "LO".
- If "HI" is selected the units shall run at their individually set speeds.
- If "LO" is selected, each unit will be set back by a global amount (see adjusting Low Speed below).
- If Low Speed is selected, this setting will remain in effect until High Speed is selected or the power is cycled.

#### Adjusting Low Speed Set Back (LS)

- This action requires access levels A1-A2.
- Use the Select dial to display the "LS" menu option.
- Rotate the Adjust dial to vary the set-back percentage (0-99%).

#### Selecting Pressure Switch (Pr)

- The Pressure switch option should be enabled if Phase Controlled units have a pressure switch installed
- Rotate the Adjust dial to select:
  - "NC": Normally closed. (The switch opens if there is a pressure fault.)
  - "NO": Normally open. (The switch closes if there is a pressure fault.)
  - " ": No pressure switch.

#### Global Speed Set (All)

- This is available only when operating at Access Level 1.
- Rotate the Adjust dial to set the desired speed.
- Press the Adjust dial to set every node to that speed.

## CONTROL CONSOLE OPERATION (CONTINUED)

### ACCESS LEVELS

To restrict access to functions other than monitoring, the Control Console implements access levels. Level A1 carries the greatest privileges.

ACCESS LEVEL	PASS CODE	DESCRIPTION
A1	12 88	OPERATOR CAN ADJUST CONFIGURATION SETTINGS.
A2	25 75	OPERATOR CAN USE ALL FUNCTIONS FOR MONITORING AND CONTROL.
A3	49 51	OPERATOR CAN MONITOR AND ADJUST HIGH/LOW SETTINGS.
A4	N/A	OPERATOR CAN ONLY MONITOR STATUS OF THE NETWORK.

## LIMITED WARRANTY

Krueger warrants the equipment will be free of defects in materials and workmanship under normal use for a period of one (1) year. The HEPA filter shall only be warranted against loading for a period of one (1) year when operated in clean room conditions. Krueger's sole obligation under this warranty is to repair or replace any parts of the equipment which are defective for a period of one (1) year from the invoice date, provided that the repair or replacement is actually performed within the one (1) year period from the invoice date. The buyer agrees to assume any incidental expenses including, but not limited to, the cost of transporting the defective equipment to Krueger's repair facility. The buyer's sole remedy under this limited warranty is the repair or replacement of any defective part of the equipment.

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