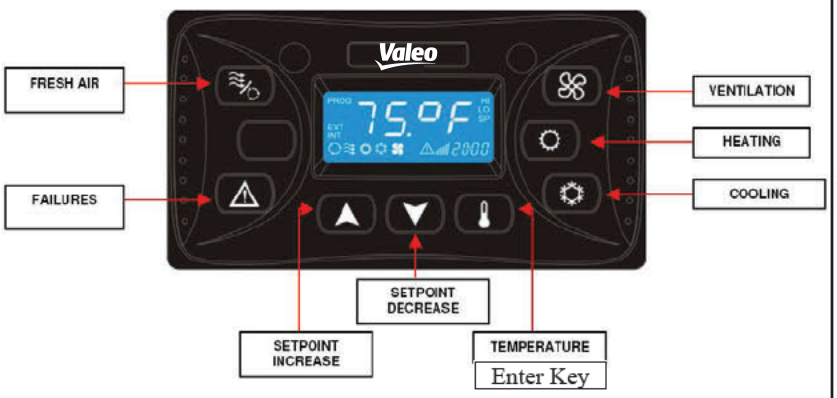
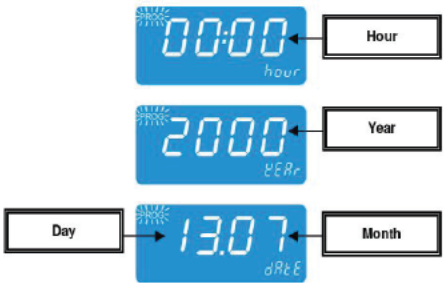
Advanced Monitoring & Diagnostics System (MDS)

Operation Instruction – CAN bus system

The MDS electronic controller is a micro processor based device. It is designed to control, diagnose, test, and monitor mobile heating, ventilating, and air conditioning systems. It actively obtains temperature, pressure and voltage information. The controller has outputs to the blower, heat valves and compressor(s) to achieve desired temperature levels within a vehicle.

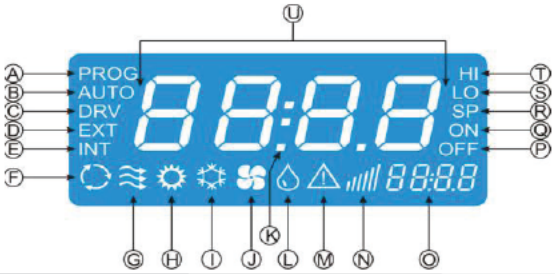
1. **Control panel date and time adjustment.**
When the controller is turned ON for the first time, the software version is shown in the display. Next, the date and time should be adjusted.
If the operator does not want to set the date and time ⚠ can be pressed 1 time to skip it.
Use the ▲ or ▼ buttons to select the Hour, Min, Year, Month, Day in that order pressing 🌡 after each entry and move to the next.





Each time the MDS controller is disconnected from battery the date and time will require adjustment. As long as battery power remains the date and time will be retained.
To re-adjust the Date and Time the MDS controller must be disconnected from battery power by simply unplugging and re-plugging the connector on the back of the digital controller.

2. **Numerical Display.**
Upon initial startup the display will show the software version and set point value. It also shows schedules, alarms, clock, failures and indication signals. To view the internal or external temperature, press 🌡. (This button also acts as an Enter Key to be pressed when applying any setpoint changes).



Index	Indication
A	Controller is in programming.
D	Indicated when visualizing the external temperature.
E	Indicated when visualizing the internal temperature.
F	Closed fresh air.
G	Open fresh air.
H	Indicated when the heating will be activated.
I	Indicated when the refrigeration will be activated.
J	Indicates manual ventilation activated.
K	Indicates compressor is activated in refrigeration mode or valve when in heating mode.
M	Indicated when the controller is in any failure.
N	Indicates the evaporator speed. Speed should be counted each two lines.
O	Visualization of the programming values, product clock and failure description.
R	Indicated when it will be adjusting or visualization of the set point value.
S	Indicated when any value reaches the minimum adjustable.
T	Indicated when any value reached the maximum adjustable.
U	Visualization of the internal temperature, external temperature, parameters value, failures code, auxiliary data, etc.

Note: The symbols **B**, **C**, **L**, **P** and **Q** are not used in this product.

3. **Set point.**

Set point is the desired temperature inside the vehicle. To adjust it, press ▲ or ▼. Maximum and minimum allowable set point values are parameters preprogrammed from the factory.

4. **Manual Control.**

Cooling and heating control can be set to manual.

Cooling: If ☼ is pressed with internal temperature above the set point (and all pre-programmed parameters are met), the compressor clutch will engage and the system will start cooling. When the system initially starts in cooling mode, the blower fans will start in AUTO mode. If ❀ is pressed, the blower speeds can be change manually by pressing ▲ or ▼.

Note: Thirty (30) seconds will elapse until the compressor starts up again, when it has been turned OFF.

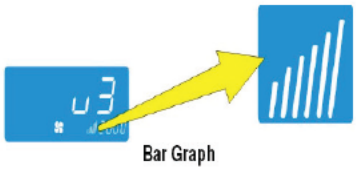
Heating: If ☼ is pressed with internal temperature below the set point (and all pre-programmed parameters are met), the heating system will start.

There is a preprogrammed range around the set point for both heating and cooling. *For example*, if the set point is 60°F, with a preprogrammed range of +/-4°F, the heater will shut off once 60°F is reached on the internal temperature probe, the heat would then again resume when that temperature reached 56°F. In each mode (heat or cooling) once the set point is satisfied and either the clutch is cycled off or the water valve is closed the blower will continue to circulate air.

Note: Switching from Heating to Cooling mode or vice versa is not automatic. When needed the Heating or Cooling button must be pressed.

5. **Blower Speeds**

The blower speed (Ventilation) function is activated by ❀.
There are three speeds. To change the fan's speed the VENTILATION function ❀ must be selected. Press ▲ or ▼ to adjust it.
To turn OFF, press ❀ and press the ▼ until **u0** appears.



Ventilation operation is shown through display Bar Graphs.

Speed	Bar Graph
u0	
u1	
u2	
u3	

Mode	Control
1	Blowers on low speed
2	Blowers on medium speed
3	Blowers on high speed

6. FAILURES AND ALARM CODES

In case of failure, alarm or event conclusion, the failure alert symbol flashes on the display until it has been recognized.

A.) To see the failure alarm or event press ⚠ Select Nod1 or Nod2 by pressing 🌡. To see when the failure alarm or event happened press 🌡. Display will show date, and then the hour the fault happened. When the failure has been looked at (as long as the issue/problem has been fixed) the flashing will go away and typical operation will be resumed.

B.) To clear the history of events as well as the fault codes press ⚠ Select Nod1 or Nod2 by pressing 🌡. Then press and hold ⚠ for 3 seconds or until the screen flashes and **F - - -** appears. At this point all faults have been cleared. If there is anything else that still appears then this is still an active fault.

The basic failure codes are as follows:

Code	Failure	Description
F000	Internal temperature sensor	In case of internal temperature sensor fails, system gets 71°F temperature.
F008	Discharge transducer	In case of discharge transducer fails, product turns OFF compressor. Turn ON again after 3 minutes that failure to cease
F009	Suction transducer	In case of suction transducer fails, product turns OFF compressor. Turn ON again after 3 minutes that failure to cease
F100	D+ (Alternator)	In case of D+ fails, product turns OFF all functions.
F104	Battery voltage > 16V (12V) Battery voltage > 32V (24V)	If one of these failures happens, product turns OFF untill normal work voltage backs.
F105	Battery voltage < 9V (12V) Battery voltage <18V (24V)	
F106	Battery voltage >15V (12V) Battery voltage > 30V (24V)	If one of these failures happens, product keeps control ON and show failure alert on panel.
F107	Battery voltage < 10V (12V) Battery voltage < 19V (24V)	
F202	High pressure switch or high discharge pressure > **P359** *	If one of there failures happens, product turns OFF compressor. Turn ON again after 3 minutes that failure to cease
F205	Low pressure switch or low suction pressure < **P361**	See description in item 5.1
F206	Low suction pressure < **8Psi** during 5s **	If one of there failures happens, the product turn off the compressor and condenser and just turn ON again if the suction pressure rise 7psi and after the driver view the failure in the history.
F300	Communication	----------

To clear the failure history, select the corresponding **"nod"** and keep the key pressed for a few seconds until the **F---** message is shown. Should any failure to be shown again, check the controller.

For more extensive troubleshooting and diagnostics please contact
Valeo Thermal Commercial Vehicles NA, Inc., *Tech Support at 800-462-6322*