



# DEXON CANADA AIR SYSTEMS INC.

## TROUBLE SHOOTING GUIDE for SMDH SERIES with TACHOP PCB

<p>“Power On” LED is NOT on</p>	<ol style="list-style-type: none"> <li>1. Check control power to TB7 in blower heater.</li> <li>2. Check control power fuse and for short circuits.</li> <li>3. Check fuse on 95DH Main Controller.</li> <li>4. Check 95DH Main Control Board for damage or for short circuit.</li> <li>5. Check that the transformer on 95DH Main Controller hasn't come lose or is damaged.</li> <li>6. Check for 12VDC between brown and grey wires to the status board at TB3 on 95DH Main Controller and the same wires on the status board.</li> </ol>	<ol style="list-style-type: none"> <li>1. Restore power.</li> <li>2. Replace fuse if required.</li> <li>3. Replace fuse if required.</li> <li>4. Replace or have 95DH Main Controller repaired.</li> <li>5. Send 95DH Main Controller in for repairs if required.</li> <li>6. If 12VDC is not present check connections, for short circuit or controller damage and send in for repair if required.</li> </ol>
<p>“Fan Stopped” LED is on</p>	<ol style="list-style-type: none"> <li>1. Check the “Low Temp.” LED for indication of a “Low Temp.” shut down condition.</li> <li>2. Check fan; if it's not running check fan terminals for corrosion, frost build up or impeller restrictions.</li> <li>3. Check for fan power at TB5 on 95DH Main Controller; if no power, check connections, for short circuit or controller damage.</li> </ol>	<ol style="list-style-type: none"> <li>1. If shut down press the “Reset” switch.</li> <li>2. Remove restrictions and replace fan if required.</li> <li>3. If damaged replace or send 95DH Main Controller in for repairs.</li> </ol>
<p>“Low Temp.” LED is on</p>	<ol style="list-style-type: none"> <li>1. Check for element power at TB8 in blower heater.</li> <li>2. Visually inspect all Klixon thermostat(s) on the elements and on the Heat Sink above the elements for damage.</li> <li>3. Ensure the unit is not in “Manual” mode.</li> <li>4. Check that the fan voltage is set as per specifications (see quality control test report).</li> <li>5. Check if the “Overheat” LED is on.</li> </ol>	<ol style="list-style-type: none"> <li>1. Restore power.</li> <li>2. Replace damaged Klixon thermostat(s) if required.</li> <li>3. Set to “Auto” and press “Reset” switch.</li> <li>4. Adjust as required.</li> <li>5. If on see “Overheat” LED below.</li> </ol>
<p>“Overheat” LED is on</p>	<ol style="list-style-type: none"> <li>1. Check overheat thermostat for continuity between the leads at TB4 on main board. It should be in a closed circuit condition.</li> <li>2. Check element relay(s) for current leakage by disconnecting control power to eliminate any demand and check for a current draw on the element power supply leads.</li> </ol>	<ol style="list-style-type: none"> <li>1. If in open circuit condition check the thermostat for damaged leads and replace as required.</li> <li>2. If there is current draw and there is no demand replace the relay(s).</li> </ol>
<p>“Element” LED is off or inactive</p>	<ol style="list-style-type: none"> <li>1. Check that the ambient outdoor temperature is not above the discharge set point as indicated on the quality control test report in appendices.</li> <li>2. If the ambient temp. is below the set point check if unit is in “Low Temp.” shut down condition or “Overheat” due to corroded overheat thermostat.</li> <li>3. Check that there is power to the status board and TB7 on the 95DH Main Controller.</li> </ol>	<ol style="list-style-type: none"> <li>1. If the ambient temperature is above the set point then there is no demand; unit is working as intended.</li> <li>2. Refer to the “Low Temp.” shut down and “Overheat” conditions above.</li> <li>3. Refer to status board “Power On” condition above.</li> </ol>

If the above recommendations do not solve the problem please contact Dexon Canada Air Systems at 403-930-1284 or email [techsupport@dexoncanada.com](mailto:techsupport@dexoncanada.com)

# 95DH MAIN CONTROL BOARD

"Low Temp." shut down bypass timer LED: The LED will blink until the timed delay has ended. Note: In order to allow time for the heat sensor to reach its set point temperature a 7-8 minute bypass is built into the controller for cold starts. If the discharge temperature is below 0°C and the set point is not reached in the allotted time the blower heater will go into a "Low Temp." shut down condition.

To normally closed  
overheat thermostat  
in heat exchanger

12VDC output to  
Crydom SS Heating  
Relays. May be  
Pulsing or Steady  
24VDC stg1 stg2 stg3

Fan Adjustment  
Potentiometer

0 to 10VDC should be  
present here. Fan volts  
are variable with Fan  
Adjustment Pot  
0-10VDC 24VDC n/c com

Heat 2  
Heat 3  
Common  
Manual Reset  
Heat 1  
Fan  
Overheat  
Low Temp.  
Fan Stopped  
12VDC Power  
TO STATUS BOARD

TachOP PCB Jack

"SP4" – Low Temp Restart Test Pin. Positive Lead on DC Volt Meter 0-20V Range

"SP1" – Stage 1 Temp. Set Point Test Pin. Positive Lead on DC Volt Meter 0-20V Range

"SP" – Set Point Potentiometer for Discharge Temperature Adjustments

"DP" – Discharge Temperature Test Pin. Positive Lead on DC Volt Meter 0-20V Range

"COM" Common Test Pin. Negative Lead on DC Volt Meter 0-20V Range

"SP3" – Stage 3 Temp. Set Point Test Pin. Positive Lead on DC Volt Meter 0-20V Range

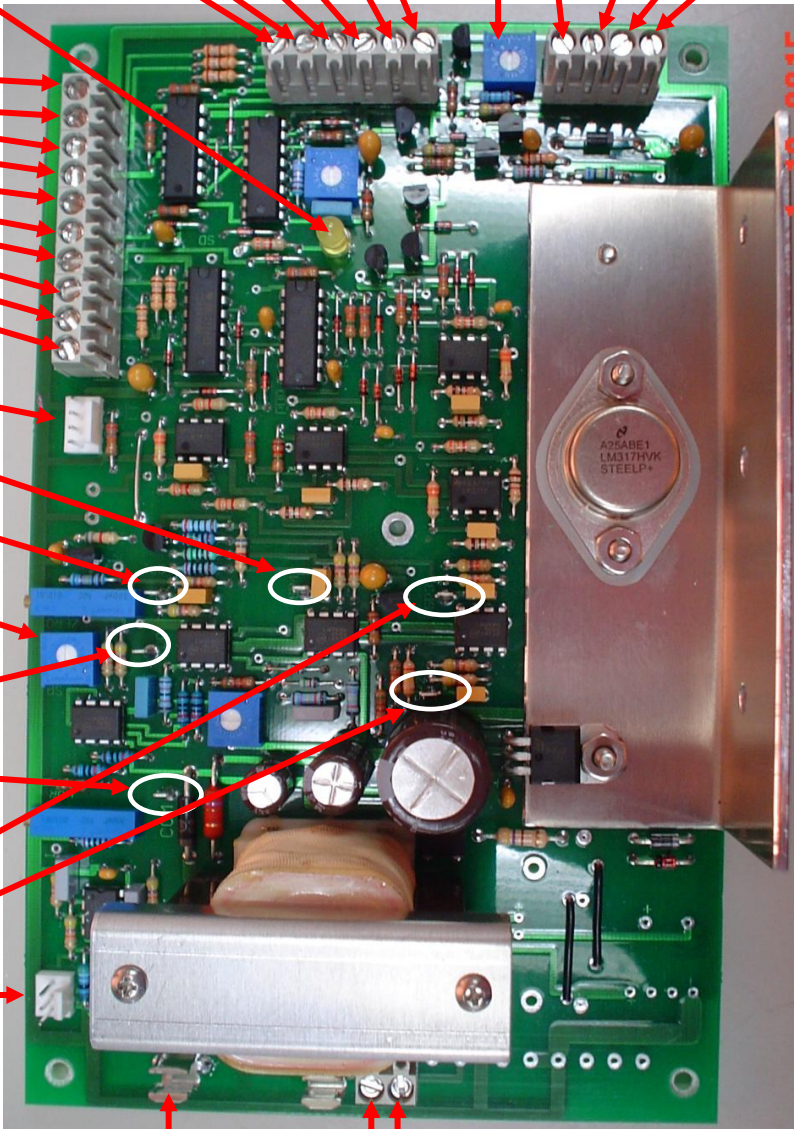
"SP2" – Stage 2 Temp. Set Point Test Pin. Positive Lead on DC Volt Meter 0-20V Range

Temperature Sensor Jack

**IMPORTANT: Please contact Dexon Canada Air Systems Inc. before adjusting any potentiometers (pots). There are only 2 pots that can be adjusted onsite and this should only be done when absolutely necessary and by qualified personnel only.**

Controller Fuse Brackets – 500MA - Type AGC Fuse

120Volt Power 120VAC should be present here



## DEXON 95DH MAIN CONTROLLER TEST PINS DESCRIPTION

NOTE: We recommend using “Minigrabber” type test leads that clip/hook on to the test pin holes for measurements on the 95DH Main Controller to prevent accidentally shorting out test pins to components in close proximity. IMPORTANT: When taking measurements the voltage does not equate exactly to temperature, there is a 0.1VDC offset; for example (0.7VDC = 6°C), (1.1VDC = 10°C), (0.9VDC = 8°C).

TEST PIN	DESCRIPTION
COM	- Is the common pin for all 95DH Main Controller and Airflow Circuit Board voltage tests (0-24VDC Range). The negative from a DC Volt Meter goes here for each sampling.
DP	- Is the Discharge actual temperature as per the temperature sensor located near the bottom of the blower heater in a small aluminum tube (See Dexon 95DH Main Controller for Temperature Sensor Jack).
SP1	- Is the set point temperature that will be maintained at the blower heater discharge at the bottom of the blower heater. The desired temperature may be adjusted by turning “SP” (Set Point discharge temperature adjustment potentiometer) clockwise to increase or counter clockwise to decrease. Typical range is +5°C to +10°C (0.6VDC to 1.1VDC). IMPORTANT: Please contact Dexon Canada Air Systems Inc. (403-272-0562) before making any adjustments any potentiometers. Note: the airflow in “Auto” mode is preset by Dexon based on airflow requirements and heating capacity. Increasing the airflow should only be done if airflow is inadequate due to unforeseen on-site piping/ducting friction. Adjustments should only be made when absolutely necessary and by qualified personnel.
SP2	- Is the set point at which the stage 2 element will engage in order to maintain SP1 set point. As the outdoor temperature drops the stage 2 elements are called upon to provide heat when the DP (down pipe) temperature sensor drops to where the SP2 set point is set. Typically 0.5VDC = +4°C.
SP3	- Is the set point at which the stage 3 element will engage in order to maintain SP1 set point. As the outdoor temperature drops the stage 3 elements are called upon to provide heat, when the DP (down pipe) temperature sensor drops to where the SP3 set point is set. Typically 0.35VDC = +4.5°C.
SP4	- Is the low temperature automatic restart set point. This is the temperature at which the blower heater will automatically restart after a low temperature shut down has occurred. A low temperature shut down occurs when the discharge temperature drops below 0°C and the fan shuts down to prevent freezing of the space. As the outdoor temperature warms up the fan will automatically reset and start up based on the SP4 temperature set point. Typically 0.2VDC = +1°C.

### CONTACT INFORMATION:

Email: [techsupport@dexoncanada.com](mailto:techsupport@dexoncanada.com), Website: [www.dexoncanada.com](http://www.dexoncanada.com)  
Tech Support Phone: 403-930-1284, Admin Phone: 403-272-0562

## STATUS BOARD – 95STS

The information provided on these pages assumes there IS a problem and there are no issues with the 95DH Main Controller, the 95STS Status Board or wiring problems.

“Power On” LED: When lit indicates that the status board is receiving power from the 95DH Main Controller located inside the blower heater. If it is not lit - check to ensure the control power circuit is energized inside the blower heater. If the circuit is energized; check the fuses leading up to and on the 95DH Main Controller, then check the wiring between the blower heater and the status board.

“Element 1” LED: When this LED is blinking/pulsing it’s an indication that the outdoor temperature is such that the 95DH Main Controller is calling for heat. The continuous blinking/pulsing indicates that the blower heater is easily maintaining the preset discharge temperature.

Please Note: “Element 2” and “Element 3” LEDs will only be active when stage 1 cannot maintain the preset discharge temperature on its own and stage 2 and/or stage 3 elements are required. These LEDs will not blink/pulse.

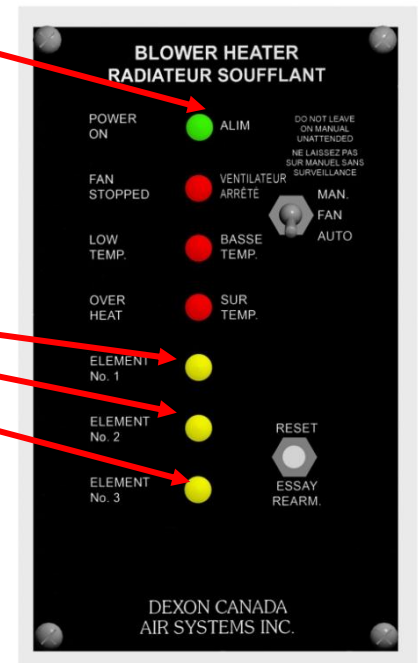


Figure 1: Normal Operations

“Overheat” LED: When lit indicates that an “Overheat” condition has occurred. This condition may be the result of either the Crydom Solid State Relay failing, the overheat thermostat at the top of the heat exchanger has had its wiring corrode off or has opened its internal contact (normally closed contact becomes open).

Relay Fail test: Turn off the control power and check for current in the heating circuit. If a current is measured the relays could be leaking across their voltage barrier, have found a current path to ground or have completely shorted out.

Overheat Sensor test: If the relays are fine check the continuity of the overheat thermostat, it should be in a normally closed state to allow heating. See Dexon 95DH Main Controller page for location of the overheat thermostat wires.

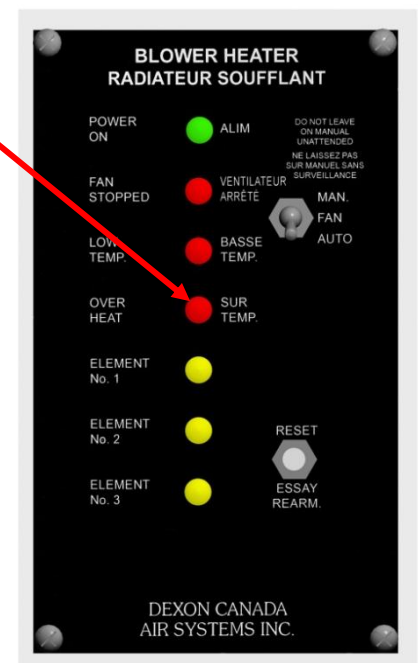


Figure 2: “Overheat” Indication



“Power On” LED and “Fan Stopped” LEDs are both lit: Is an indication that there has be a fan failure or if there is confirmation of the fan running then possibly issues with the 95DH Main Controller, status board or TachOP PCB. If fan is not running; confirm that there is power output from the 95DH Main Controller to the fan. If you confirmed the fan is running and there is still a “Fan Stopped” indication then there is an issue with one or more of the control boards.

**IMPORTANT:** When the “Fan Stopped” LED is lit the heating elements are disabled for safety. If the outdoor temperature is below 0°C this will lead to a “Low Temp.” shut down condition; if this does occur the “Low Temp.” LED will also light up.

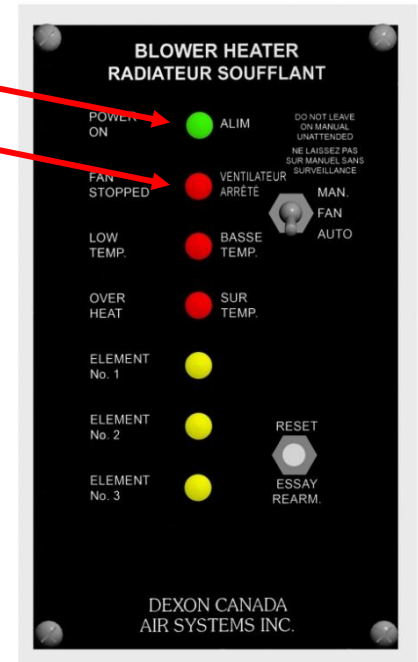


Figure 3: “Fan Stopped” Indication

“Power On”, “Fan Stopped” and “Low Temp.” LEDs are all lit: In cold temperatures this is the most common failure indication. This can be due to a “Low Temp.” shut down condition which causes the “Fan Stopped” indication or a “Fan Stopped” indication which activates the “Low Temp.” shut down feature since the “Fan Stopped” condition will disable the heating elements. This occurs at temperatures below 0°C.

The “Fan Stopped” LED: Will light up in the event of a fan failure or if a “Low Temp.” condition occurred as described above. Check the fan for operation and check to ensure the heating circuit is energized (breaker is on).

The “Low Temp.” LED: Will light up due to a lack of heating; the heating circuit is off or one or more heat sensors are open. This is most commonly due to corroded wire leads in the heat exchanger. It could also be caused by a temperature sensor failure, a sensor out of calibration or the 95DH Main Controller has failed.

Note: A “Low Temp.” condition can also occur in Class 1, Div. 2 blower heaters as they have overheat thermostats mounted directly on each of the heating elements. These normally closed thermostats shut down the heating if the heating element skin temperature reaches close to ignition temperature of the gases in the Gas Groups C & D. There is no status indication for this condition; check for open contact, corroded wires etc.

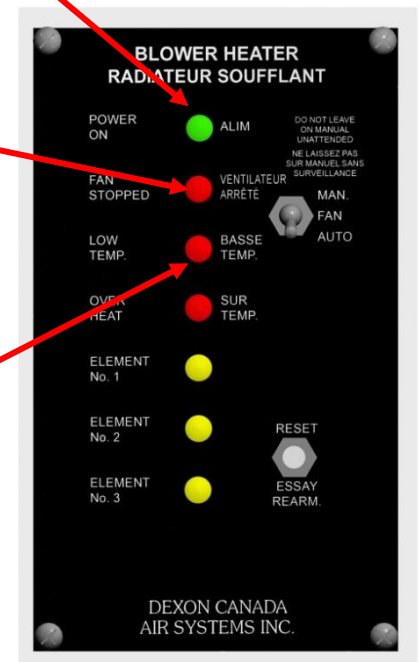


Figure 4: “Fan Stopped” Indication with “Low Temp.” Indication

**“Manual/Auto” Toggle Switch:**

**DO NOT LEAVE UNIT IN MANUAL MODE UNATTENDED**

This switch is primarily used to purge/flush/ventilate a confined space prior to entry.

In “Auto” mode the blower heater runs at a preset level based on the required airflow rate; generally based on the area of the space and the safety ventilation requirements of the location. For continuous airflow in “Auto” mode all safety features of the unit are active.

In “Manual” mode the fan is put into full speed; this is to purge/flush/ventilate the space only. This is not meant for continuous operation since the heating capacity of the unit is sized for only the continuous airflow rate.

It is important to note that in “Manual” mode the “Low Temp.” shut down feature is bypassed/disabled to ensure the unit does not shut down while the confined space is occupied. This bypass can be used to allow heating even in a “Low Temp.” shut down in order to defrost the fan if frosted up. The fan will often restart once thawed.

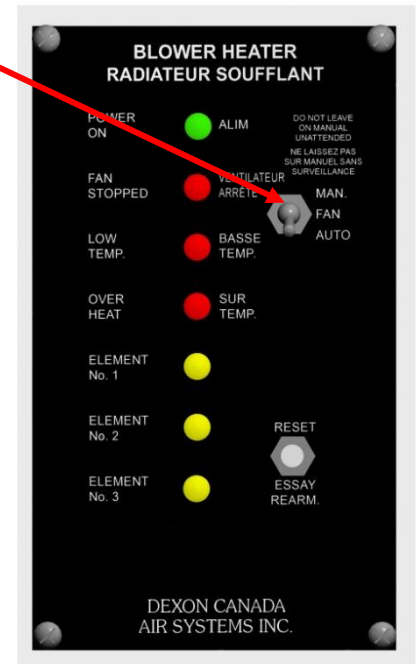


Figure 5: “Manual/Auto” Toggle Switch

**“Reset” Switch:**

This switch is used in order to start a bypass timer built into the 95DH Main Controller that will allow heating for roughly 7-8 minutes regardless of the “Low Temp.” shut down condition. This is done in an attempt to warm the temperature sensor above freezing and remove the “Low Temp.” shut down. This is provided the heating elements have power and the “Fan Stopped” LED is not lit.

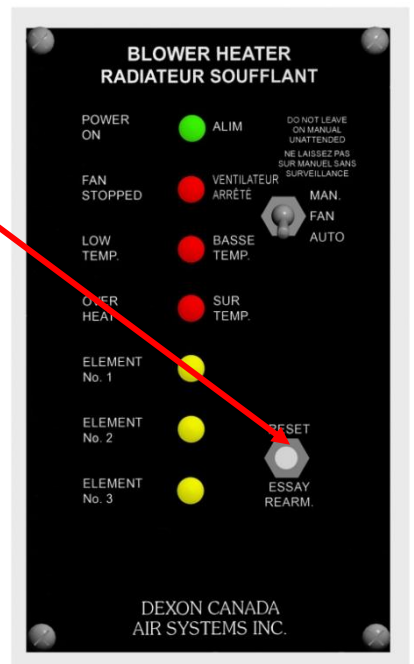


Figure 6: “Reset” Switch

**CONTACT INFORMATION:**

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