R340 and R410 Fuel Cell Compressor Motor and Controller Assembly

Innovative Solutions... for Electrifying Vehicles
UQM Fuel Cell Compressor Systems are ideal for ease of maintenance, long term durability, and low lifetime operational cost. The UQM System is an integral component of hydrogen powered fuel cell vehicles designed for light duty automotive and commercial bus applications for 75kW to 150kW fuel cell stacks. The UQM Fuel Cell Compressor System offers a larger efficiency window than centrifugal compressors and offers significant heat and noise reduction over comparable twin screw compressors.

**Product Description**

- Each UQM System features Eaton Corporation’s 6th generation TVS, 4-lobed involute profile rotors with 160° helical twist in its superchargers (compressors).
- The Multiple Orientation Capable Compressor (MOCC) allows for various installation orientations and oil level monitoring.
- Sound dampening enclosure surrounding the supercharger minimizes system noise.
- Optional inlet attenuator reduces intake noise further without restricting airflow.
- A fully integrated UQM 20kW brushless DC motor is available in 12-turn 400Vdc or 24-turn 800Vdc configurations to direct drive the compressor.
- The system is Hall-controlled over a CAN interface at 250 or 500 kbps rate.
- Liquid cooled UQM motor and controller are configured to be interchangeable with similar systems for fleet operation and maintenance.
- Power and communication cables are provided with the motor. Connectors are provided to interface with user’s application and the controller.
- End of Line Verification testing performed on all UQM Fuel Cell Compressor Systems.
- Performance verification data available upon request.
- Leak check performed on all motors and controllers.
- On-board error data logging.
- Power limitation for thermal protection. Power is limited automatically by controller once internal temperature limit is reached.
- Positive pressure seals protect compressor oil from entering air stream.
- The TVS Roots-based R340 and R410 compressors offer significant noise and heat reduction than comparable twin screw compressors.
- The TVS Roots-based R340 and R410 compressors offer a larger efficiency window than centrifugal compressors.
- Warranties available on all UQM Fuel Cell Compressor Systems (prior engineering approval of customer operating duty cycle and application parameters required).

**Applications**

- The **R340 System** is designed for light-duty automotive applications for up to 75kW stacks.
- The **R410 System** is designed for medium-duty automotive and commercial bus (coach) applications for up to 150kW stacks.

**Customer fleet and vehicle applications currently supported globally**

- England (fleet)
- Belgium (fleet)
- Amsterdam (fleet)
- Canada (fleet)
- India (evaluations)
- USA (evaluations)
- Germany (evaluations)
- Italy (evaluations)
- China (evaluations)
R340 and R410 Configuration Specifications

<table>
<thead>
<tr>
<th>Parameter Name</th>
<th>Units</th>
<th>Min</th>
<th>R340 Max.</th>
<th>R410 Max.</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outlet Flow Rate</td>
<td>m³/h</td>
<td>0</td>
<td>340</td>
<td>420</td>
<td>At 1.1 pressure ratio</td>
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<tr>
<td>Outlet Line Air Pressure (Continuous)</td>
<td>kPa abs.</td>
<td>95</td>
<td>180</td>
<td>180</td>
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<tr>
<td>Outlet Line Air Pressure (Instantaneous)</td>
<td>kPa abs.</td>
<td>95</td>
<td>220</td>
<td>220</td>
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<tr>
<td>Inlet Ambient Pressure</td>
<td>kPa abs.</td>
<td>85</td>
<td>107</td>
<td>107</td>
<td></td>
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<tr>
<td>Inlet Ambient Temperature</td>
<td>°C</td>
<td>-20</td>
<td>40</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>Inlet Ambient Relative Humidity</td>
<td>%</td>
<td>5</td>
<td>99</td>
<td>99</td>
<td></td>
</tr>
<tr>
<td>System Input Voltage (Low Voltage Platform)</td>
<td>Vdc</td>
<td>300</td>
<td>375</td>
<td>375</td>
<td>12-turn motor configuration</td>
</tr>
<tr>
<td>System Input Voltage (High Voltage Platform)</td>
<td>Vdc</td>
<td>450</td>
<td>N/A</td>
<td>775</td>
<td>24-turn motor configuration</td>
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<tr>
<td>Max. Input Current (High Voltage System)</td>
<td>Amps</td>
<td>0</td>
<td>N/A</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>Max. Input Current (Low Voltage System)</td>
<td>Amps</td>
<td>0</td>
<td>100</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>System Up-Transient</td>
<td>Sec.</td>
<td>-</td>
<td>5</td>
<td>5</td>
<td>&quot;Minimum time to accelerate from 10% to 90% flow&quot;</td>
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<tr>
<td>Coolant Type</td>
<td>50/50 Glycol/Water mix</td>
<td>6</td>
<td>20</td>
<td>20</td>
<td>&quot;All testing conducted at 10L/min. Pressure not to exceed 8 psi&quot;</td>
</tr>
<tr>
<td>Controller Inlet Coolant Temperature</td>
<td>°C</td>
<td>-20</td>
<td>50</td>
<td>50</td>
<td></td>
</tr>
</tbody>
</table>

For more information and to discuss UQM capabilities in more detail, please contact us using any one of the following:

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