



## PS-DR™ Dual Range Option Fuel Cell Testing For Wide Dynamic Range

Beat the Resolution Limit Of Mass Flow Control!

Four Independent Gas Lines

Paired for Wider Range

Mass Flow Controllers (MFC) have a 1 part in 100 accuracy. To provide a high accuracy over a wide dynamic range (particularly in low flow ranges) the MFCs can be paired to provide a high and low flow range with much better precision.

When coupled with the Power Station™, the PS-DR™ gas management unit enables fuel cell and electrochemical testing of wide ranging reactant gas for PEM, alkaline, and phosphoric acid fuel cells. It provides capacity for small single cells up to fuel cell stacks.

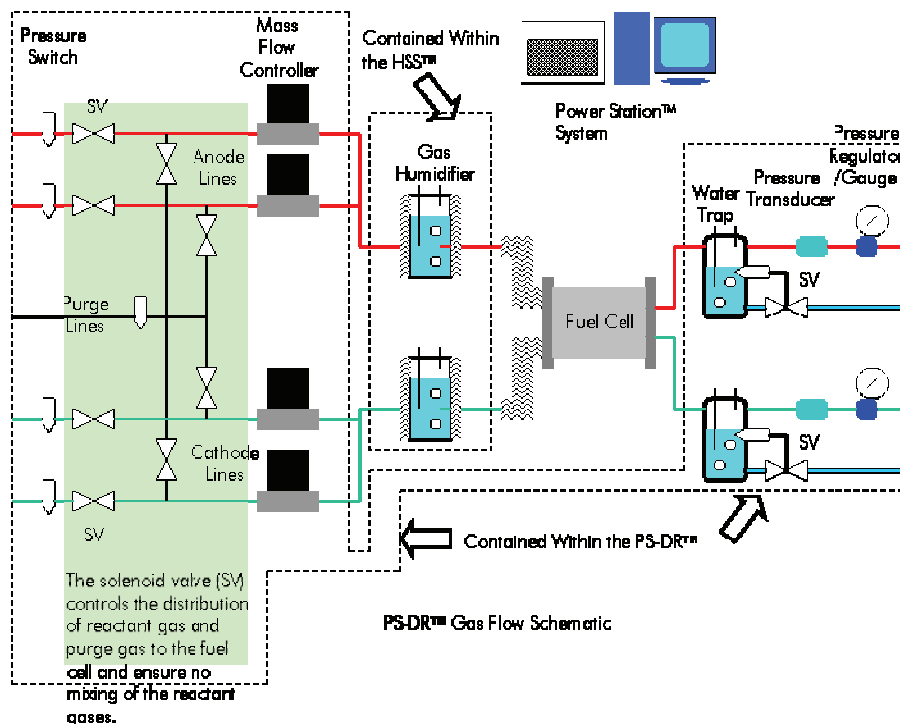
### Key Features

- Software control supports enhanced gas flow control by “teaming” large and small mass flow controller “pairs”
- Precision automated gas supply, product water collection and effluent management.
- Convenient front panel access to manual controls, and output and return gas fittings.
- Safety designed in through hardware features and software control.
- Two fuel gas lines
- Two oxidant gas lines



For further detailed specifications please check the PowerStation paragraph (page 3-12).

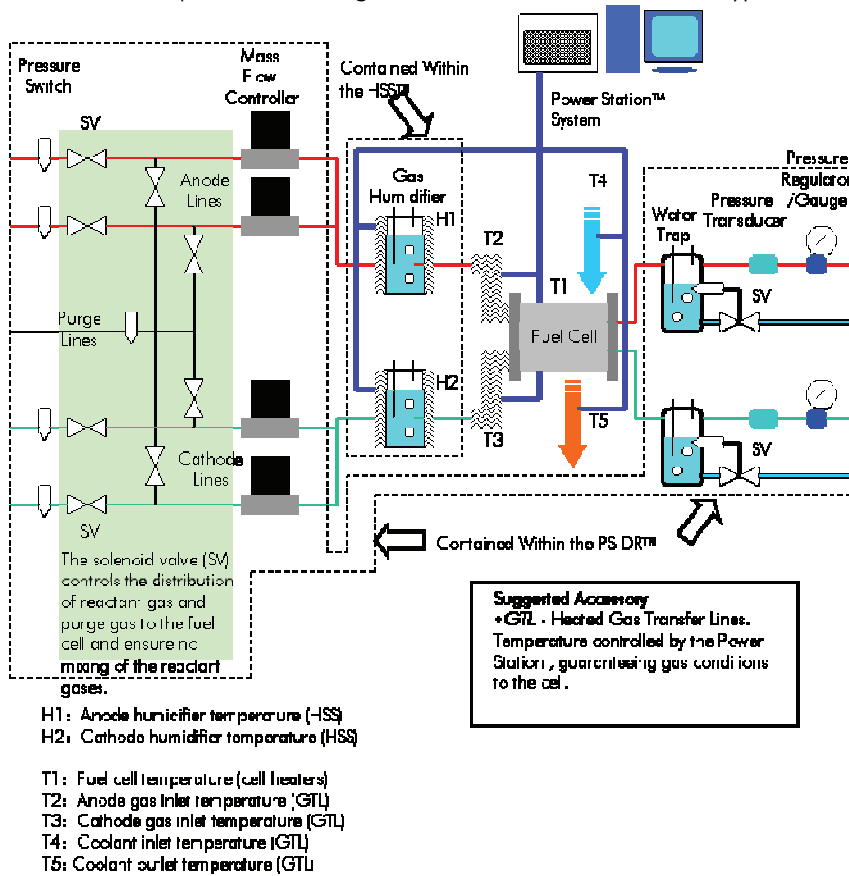
### Gas Flow control



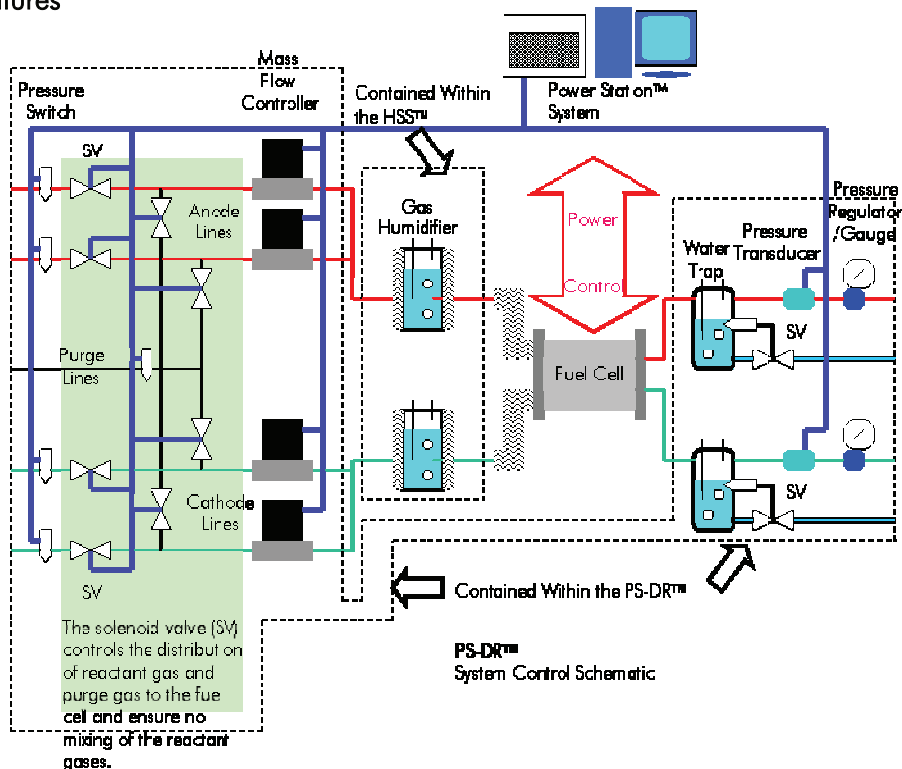


### Temperature Control Schematic

(Temperature control is not an explicit function of the PS-DR™. It is a function of the Power Station™ System Controller, the optional HSS™ humidifier and optional GTL™ gas transfer lines. Details of a typical configuration is shown below.)



### System Control Features





Specifications:															
Pressure:	Maximum Operating Pressure 50 psig (4.5 Bar)														
Mass Flow Controllers	<table border="0"> <tr> <td>Full Scale Ranges Available</td> <td>10 to 20000 sccm</td> </tr> <tr> <td>Control Range</td> <td>2% to 100% of Full Scale</td> </tr> <tr> <td>Accuracy</td> <td>+/-1% of Full Scale</td> </tr> <tr> <td>Repeatability</td> <td>+/-0,2% of Full Scale</td> </tr> <tr> <td>Resolution</td> <td>0,1% of Full Scale</td> </tr> <tr> <td>Wetted Materials</td> <td>316L SS, Viton™, Nickel</td> </tr> </table>	Full Scale Ranges Available	10 to 20000 sccm	Control Range	2% to 100% of Full Scale	Accuracy	+/-1% of Full Scale	Repeatability	+/-0,2% of Full Scale	Resolution	0,1% of Full Scale	Wetted Materials	316L SS, Viton™, Nickel		
Full Scale Ranges Available	10 to 20000 sccm														
Control Range	2% to 100% of Full Scale														
Accuracy	+/-1% of Full Scale														
Repeatability	+/-0,2% of Full Scale														
Resolution	0,1% of Full Scale														
Wetted Materials	316L SS, Viton™, Nickel														
Physical Characteristics	17 1/2" W x 12 1/4" H x 18 1/2" D (44 cm x 31 cm x 47 cm) 110 lbs. (50 kg)														
Gas Connections	1/4" Swagelok™ Tubing Connectors Front Panel <table border="0"> <tr> <td>Output Reactant Gases to Fuel Cell</td> <td>(4)</td> </tr> <tr> <td>Reactant Return Gases from Fuel Cell</td> <td>(2)</td> </tr> <tr> <td>Ports for Refill of Humidifier Bottles</td> <td>(2)</td> </tr> </table> Rear Panel <table border="0"> <tr> <td>Input Reactant Gases</td> <td>(4)</td> </tr> <tr> <td>Input Purge Gas</td> <td>(1)</td> </tr> <tr> <td>Output Venting of Reactant Gases</td> <td>(2)</td> </tr> <tr> <td>Output Product Water to Drain</td> <td>(2)</td> </tr> </table>	Output Reactant Gases to Fuel Cell	(4)	Reactant Return Gases from Fuel Cell	(2)	Ports for Refill of Humidifier Bottles	(2)	Input Reactant Gases	(4)	Input Purge Gas	(1)	Output Venting of Reactant Gases	(2)	Output Product Water to Drain	(2)
Output Reactant Gases to Fuel Cell	(4)														
Reactant Return Gases from Fuel Cell	(2)														
Ports for Refill of Humidifier Bottles	(2)														
Input Reactant Gases	(4)														
Input Purge Gas	(1)														
Output Venting of Reactant Gases	(2)														
Output Product Water to Drain	(2)														
Electronic load	Power: 800 Watts (also available 2000W or 4000W) Selectable Voltage: 0-10, 0-20, and 0-50 Volts Selectable Current: 0-2, 0-20, and 0-150 Amps Constant Current and Voltage Mode: Accuracy: ± 0,25% FS for med/high ranges ± 0,50% FS for low range Resolution: 1/4000 of full scale Constant Power Mode: Accuracy: ± 3% FS for all ranges Resolution: 0,25% of full scale														
Electric Requirements	All power and control connections provided by Power Station™ Control Unit*														

