

# Smart2 PEM Series

## PEMFC Single Cell Fuel Cell Test System



- *Fully Integrated Compact Size*
- *Suitable for PEMFC single cell*
- *Automatic purge gas control*
- *Temperature measurement and control*
- *Watch-dog function*
- *Fully automatic by PC control*
- *Accurate electronic load for fuel cell application*
- *Stoichiometric control is available*
- *Nafion™ membrane type humidifiers for fuel and oxidant gas*
- *LAN communication*

### Single cell PEMFC test system

The SMART2PEM is very compact, however, fully automated and integrated at a very attractive price. This system was designed to test Max. 100Watt PEMFC . SMART2PEM includes PC controlled electronic load, gas controller and humidifiers Our control and measurement software with powerful graphical user interface makes you easy to operate the SMART2PEM. With the exceptional features of the SMART2PEM, you can digitize your fuel cell economically and evaluate it easily.

100Watt SMART2PEM supports the following safety feature

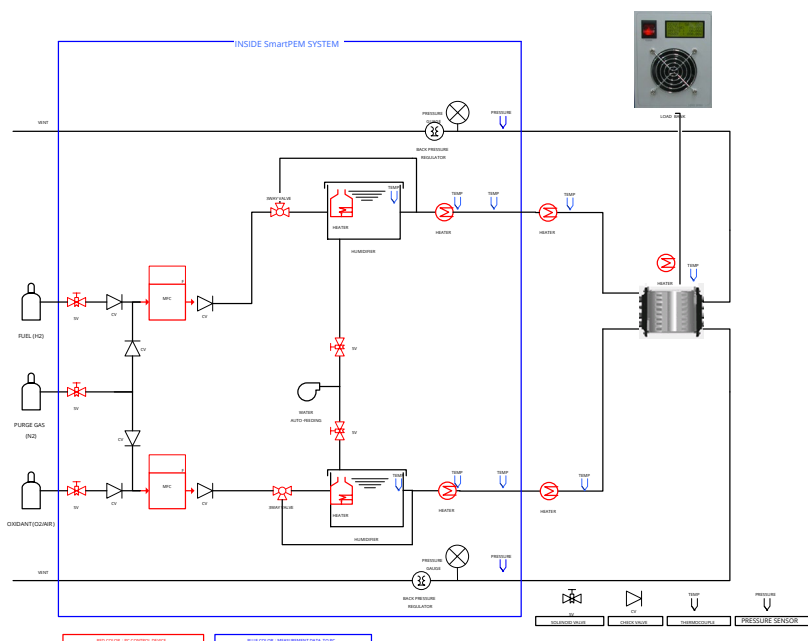
1. Watch dog function: If there is no communication between control PC and system, System will be stopped automatically
2. Emergency button: Hardware and software emergency button provided
3. User can set safety limit value for each devices
4. Low voltage limit and high voltage limit setting: If the fuel cell is over high voltage limit or less than low voltage limit, Electronic load will not discharge the cell.
5. Water supply: Automatic water supply is done by level sensor(high & low)

The WFTS software for Smart2 series is a convenient and powerful tool allowing:

- Quick and Easy Test Configuration
- Real-Time Graphic Data Output
- User Friendly Graphical User Interface & Continuous Data Logging
- Background server program
- Independent Data Managing software
- VOI (Value of Interest) Displaying selection
- Colorful display of each module status

The **Smart2PEM series** can communicate with the computer by the way of a Local Area Network(LAN).

## ● Block Diagrams



## ● Standard Configuration

- Solenoid valve: 5ea  
(fuel gas, oxidant gas, purge gas, water refill control for humidifiers)
- MFC for Anode and Cathode (2set)
- Check valve: 6ea (Each MFC has two check valve at in & out;  
Purge gas out for anode & cathode)
- 3 Way valve: 2ea for wet gas or dry gas selection
- Humidifier : 2set & Automatic water feeding for humidifier: 2ea
- Back pressure regulator : 2ea & Pressure sensor: 2ea
- Temperature controller(with line heater & thermocouples): 7set  
Humidifier Temperature controller 2set,  
Instrument inside gas line Temperature controller:2set,  
Instrument outside gas line Temperature controller: 2set  
cell Temperature controller: 1set
- Electronic Load 1set
- System controller including DAQ system with emergency button
- Control PC(option) with Smart software

## ● Optional equipment list

- H2 Gas detectors
- Impedance Monitor
- External potentiostat/galvanostat
- Zero voltage booster
- Fuel cell hardware fixture
- Conductivity Cell
- Conductivity jig

## ● Specification

MFC (Mass Flow Controller), 2 ea	- Max. Flow rate : H2(2slpm),Air (5slpm) - Accuracy : 1% Full scale
Anode gas flow rate	0.04 – 2 slpm
Cathode gas flow rate	0.1 – 5 slpm
Humidifier, 2 set	- membrane type (Nafion membrane tube length: 1meter) - Automatic Water feeding system(PC control)
Built-in Precision Electronic Load	- 4 ranges(voltage & current) - Max 200Watt (Max. 100Amp, Max 50V) - Standard: 10V(1,2,5,10V) 50A(5,10,50,100Amp) Other ranges available - Control: CC, CV, CP,STEP1,STEPV,STEPP
Humidified or dry gas selectable 3way valve	
Back Pressure regulator, 2ea	0-50psi
Temperature Control System	- Control & measurement 7 points Humidifier (2), Gas line(In line:2, Outline:2), Cell Temp (1)
Temperature measurement only	- pipe line inside temperature : 2 points
Pressure measurement	- 2 points
Compact size	- 430W x 504H x 430D (mm)

All specifications are subject to change without notice.



WonATech Co., Ltd.  
7 Neunganmal 1-gil, Seocho-gu,  
Seoul, 06801, Korea  
Tel: +82-2-578-6516 Fax: +82-2-576-2635  
e-mail: sales@wonatech.com  
website: www.wonatech.com

Local Distributor