



Operating Instructions

h-tec



D103 Fuel Cell Concept Car
& Gas Station

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Introduction and Intended Use

Diminishing resources, more severe environmental impacts and the ever-increasing demand for energy force us to reconsider the structure of our energy supply system. Automobile industry and oil companies increasingly invest in hydrogen technology because it offers solutions to some of these concerns. This fascinating technology combines a sound energy supply with minimal impact on our natural resources.

Hydrogen is produced and stored in the Hydrogen Gas Station. The Fuel Cell Concept Car is fueled with hydrogen, and realistically demonstrates the technology of future fuel cell vehicles.

The equipment can be used to demonstrate the operation of PEM (Proton Exchange Membrane) fuel cells and PEM electrolyzers.

The equipment has been developed for teaching and demonstration purposes only.

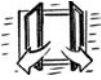


Any other use is prohibited.

Please read through the Operating Instructions carefully beforehand.

h-tec
Hydrogen Energy Systems

wishes you many enjoyable hours with your Hydrogen Gas Station and Fuel Cell Concept Car.

General Safety Precautions

- The system is intended for teaching and demonstration purposes in schools, universities, institutions and companies only.
- It may only be set up and operated by a competent person.
- Read the Operating Instructions before setting up the system. Follow them during use and keep them readily available for reference.
- Wear protective goggles.
- The system is not a toy. Operate the equipment and keep it and the gases produced out of the reach of small children.
- Unless specified otherwise, do not short-circuit or reverse the polarity of the terminals.
- Do not operate the system empty. Always ensure that it contains sufficient water (between the MIN/ MAX levels marked).
- Remove inflammable gases, vapours and liquids from the vicinity of fuel cells and electrolyzers. The catalysts contained in the system can trigger spontaneous combustion.
- Hydrogen and oxygen may escape from the system. To prevent the gases collecting and forming explosive mixtures only use the system in well-ventilated rooms. 
- The system may only be operated in a display case, which is sufficiently ventilated at all times. The operator is obliged to prove this by means of appropriate measurements.
- Remove from the vicinity of the system anything that could ignite the hydrogen (naked flame, materials that can become charged with static electricity, substances with a catalytic action). 
- Remove from the vicinity of the system all substances that could spontaneously ignite with increased oxygen concentration.
- Do not smoke. 
- Hoses, plugs and tanks are used for pressure compensation. They must not be fixed or secured with clamps, adhesive, etc.
- Only use the gas storage tanks belonging to or supplied with the system to store gas. Never connect other alternatives.
- Only operate the system at room temperature and ambient pressure.
- Do not position any solar modules and lights in use closer than the minimum permitted distance (30 cm between h-tec solar modules and the h-tec Videolight, and 50 cm

General Safety Precautions

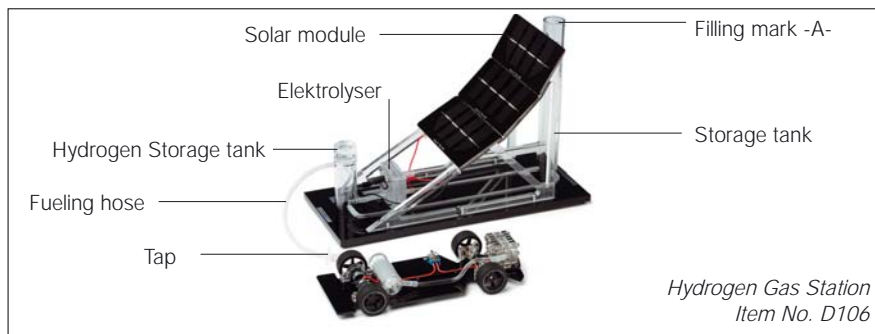
between them and the h-tec Spotlight, or see other manufacturers' stipulations).

- The surface of solar modules can get very hot during extended operation.

- Tell your students about any potential dangers and carefully supervise experimentation.

h-tec will not accept any responsibility for injuries or damage sustained in the event of these Safety Precautions not being followed.

View of Hydrogen Gas Station



Operating Instructions Hydrogen Gas Station

1. Read the General Safety Precautions.
2. Connect the tap on the fueling hose to the hydrogen storage tank.
3. Fill the storage tank up to the '-A-' mark with deionised water.
4. Open the fueling tap and allow a little water to enter the hose.
5. Connect the solar module to the electrolyzer, and irradiate it with direct sunlight or with the h-tec Spotlight or Videolight lamps.
6. The h-tec PowerSupply Junior mains power supply can be used in place of the solar module.

Technical Data

Hydrogen Gas Station

Item No.	D106
Height	230 mm
Width	360 mm
Depth	150 mm
Weight	1.2 kg

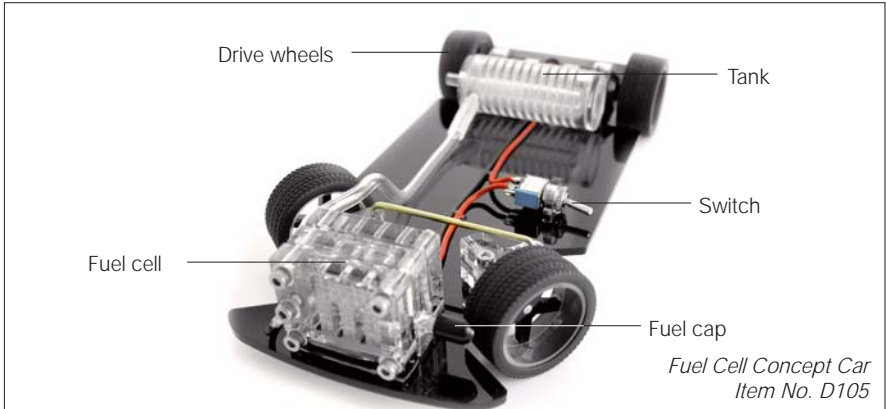
Fuel cell	-
Electrolyzer	1 W
Solar module	3
Gas tank	1

Fuel Cell Concept Car

Item No.	D105
Height	45 mm
Width	100 mm
Depth	240 mm
Weight	260 g

Fuel cell	300 mW
Electrolyzer	-
Drive front	rear
Steering	yes

View of Fuel Cell Concept Car



Operating Instructions Fuel Cell Concept Car

1. First use the Hydrogen Gas Station to produce hydrogen.
2. Place the switch in the "On" position.
3. Remove the black cap from the fuel cell.
4. Place the Fuel Cell Concept Car in such a position that the drive wheels are free to turn.
5. Connect the fueling hose from the Hydrogen Gas Station to the tank of the Fuel Cell Concept Car.
6. Open the tap on the fueling hose until the drive wheels begin to turn.
7. Place the switch in the "Off" position.
8. Replace the black cap on the fuel cell.
9. Remove the fueling hose from the tank on the car.
10. The Fuel Cell Concept Car is now ready for operation. To start it, place the switch in the "On" position.

Maintenance

Although fuel cells and electrolyzers of the type used do not require any maintenance, you should:

- Use fresh, deionised water for each session.

- Wipe the base plate dry to avoid any water stains.

