

Overview

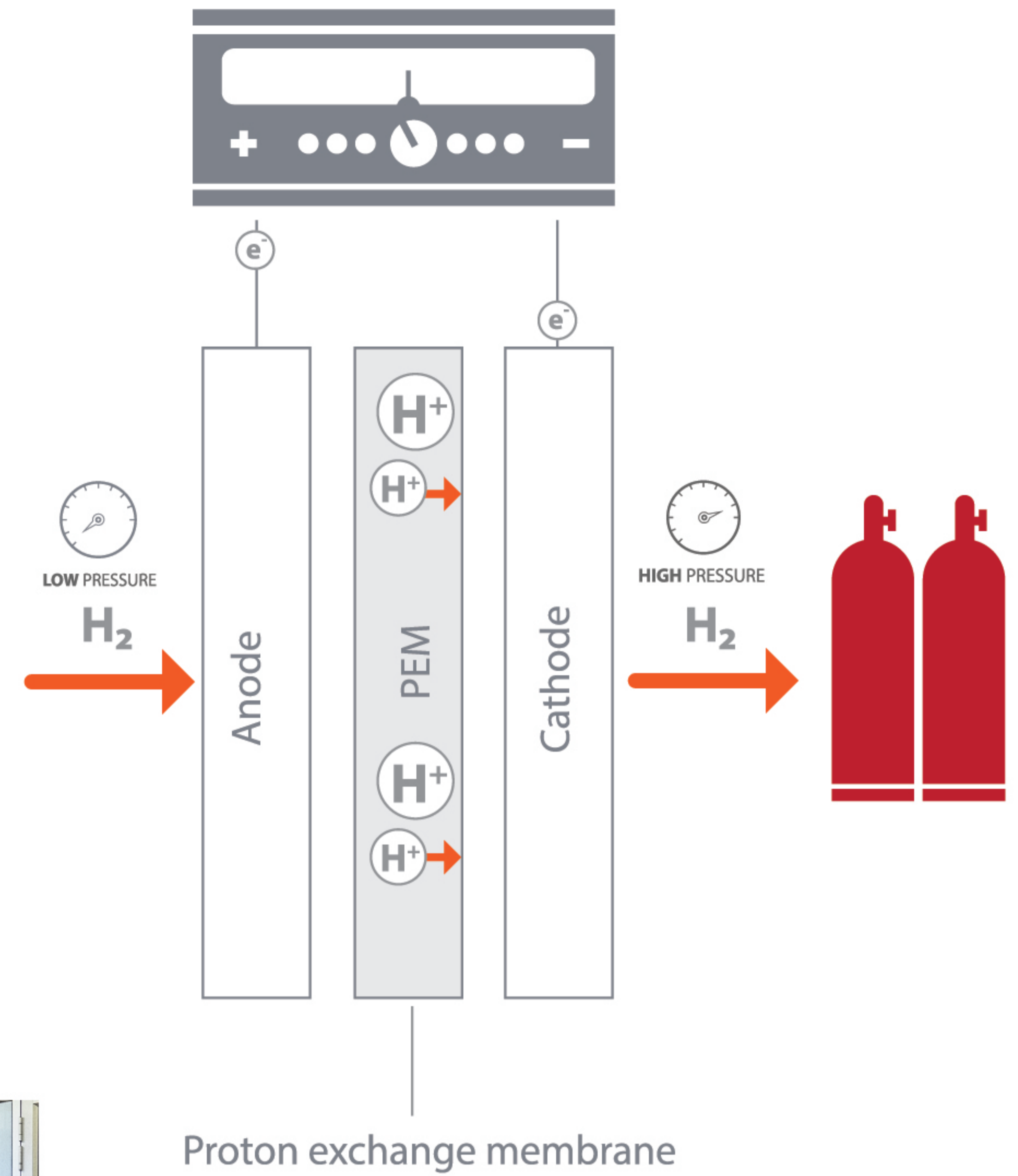
A promising possibility to utilize PGM as electro-catalysts is to electrochemically compress hydrogen to reduce hydrogen storage costs. The same principle can also be used for hydrogen purification.

Electrochemical compressor

An electrochemical compressor consists of three functional components:

Cathode
Anode
Membrane

- The anode and cathode is connected to a DC power source that controls the current.
- Low pressure hydrogen is fed to the anode, where the hydrogen is oxidized to produce protons and electrons.
- The proton passes through the membrane and the electrons moves through the electric circuit.
- At the cathode, where they are rejoined by electrons to form molecules again. This process will continued until the supply of electricity or hydrogen is stopped.



From left to right: GEN 3, GEN 2, GEN 1

Advantages

- No moving parts
- No energy losses due to friction
- Easier to eliminate product losses (easy to seal)
- Low noise level
- Suitable for small/medium scale
- Relative high efficiency
- Isothermal process
- Purifies hydrogen
- Hydrogen is not contaminated with oil
- Integrated speed control - No VSD require

SPECIFICATIONS	GEN 1 CURRENT MAPPING	GEN 2 CURRENT MAPPING	GEN 3 CURRENT MAPPING
ACTIVE AREA	25 cm ²	25 cm ²	100 cm ²
CURRENT DENSITY RANGE	0 - 2.5 A/cm ²	0 - 10 A/cm ²	0 - 10 A/cm ²
MAX CURRENT	62.5 A	250 A	1000 A
NUMBER OF CDD SEGMENTS	49	100	256
TEMPERATURE	0 - 100 °C	0 - 100 °C	0 - 100 °C
NUMBER OF TDD SEGMENTS	25	25	64