



ETEC CNG/H₂ Blending Dispenser Technical Highlights

Function

- Instantaneous blend ratios accurate to within ± 3.0 mol % (beyond sensor accuracies, see below)
- Final blend ratio accurate to within ± 0.5 mol % (beyond sensor accuracies, see below)
- Temperature compensated filling
- Variable (programmable) maximum flow rate
- Separate hoses for H₂ and CNG/HCNG blends
- Standard fueling display head
 - Mass delivered
 - Incrementing cost of fuel delivered
 - Unit price
- Separate CNG and H₂ piped inputs
- Micro-processor-controlled flow control valves each for H₂ and CNG
 - Flow control valves sized for either Transit busses or light-duty vehicles
- Coriolis-effect flow meters accurate to within $\pm 1.5\%$
- Pneumatically-actuated stop valves using process gas (CNG) to actuate valves (compressed air can be substituted for process gas as available)

Control

- Microprocessor control
 - On/off
 - Real-time blend ratio accuracy (no pulsing to achieve final blend ratio)
 - Temperature compensation
 - Auto shutoff (based on pressure/temperature and/or volume)
 - Cascade valve sequencing (each H₂ & CNG)
 - MODBUS
 - Analog I/O
 - Field reprogrammable via PC
- Internal fault detection
 - Level 1
 - Overfill Fault
 - Blend Ratio Repeat Fault
 - Pressure Transmitter Failure
 - Excess Flow Hydrogen
 - Excess Flow Natural Gas
 - Excessive Heat Detected
 - Loss Of Communication
 - Level 2
 - Overfill
 - Blend Ratio Out Of Range Error

- Blend Ratio Error
 - Blend Ratio Out Of Range Repeat
 - Incomplete Fill
 - Thermocouple Fault
- Available interface to point of sale (POS) or station control (HMI) system
 - Fill authorization
 - Blend ratio command
 - Real-time mass (or %) delivered
 - Pulse output for POS for billing
- Available telemetry output (via MODBUS)
 - Total mass of natural gas transferred
 - Total mass of hydrogen transferred
 - Actual final blend ratio
 - Start fill pressure
 - Final fill pressure
 - Target fill pressure
 - Ambient temperature
 - Fill start time (if already available)
 - Fill complete time (if already available)
 - Occurred faults
 - Output for sequencing control for each fuel
- Available PLC controls
 - HMI functions
 - External safety devices
 - Gas detectors
 - Flame detectors
 - Temperature sensors
 - Pressure sensors
 - Interface to generation and storage systems

Safety

- Low-flow switch for cabinet purge
- Vented and grounded fill hoses
- Pressure relief valves for low- and high-pressure systems (trench-mounted and pipe away)
- Explosion-proof enclosures for all controls
- Explosion-proof display head
- Explosion-proof E-stop button
- Over-pressure shut-off
- Temperature compensated maximum fill pressure calculation
- Hose leak detection

Enclosure (See Figure 1.0)

- Stainless Steel
- NEMA 4 rating
- High-hose connection design
- Locking panels front and back
- Air purged cabinet (external air supply by purchaser)



Figure 1.0 CNG/H₂ Heavy Duty Blending Dispenser Installed in Vancouver, Canada

