



# HYDROGEN VEHICLE FUELING EQUIPMENT DEVELOPMENT OPPORTUNITIES & CHALLENGES

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# ANGI Company Information

## Who is ANGI?

### Powered by ANGI

A division of GVR, ANGI are the experts in gaseous alternative fuel technology

**39**

Years' experience  
Founded in 1983 as  
Automotive Natural  
Gas Inc. (ANGI)

**No. 1**

Supplier of CNG  
refueling  
equipment in N.  
America

**22**

Number of  
countries where  
ANGI solutions are  
installed in, across 6  
continents

**14**

Acres of  
manufacturing,  
R&D and office  
space at the  
Janesville WI HQ

**2014**

Joined the GVR  
family



# GVR Company Information

## Who is Gilbarco Veeder-Root?

### Integrated Solutions

**e-Mobility solutions**

- Charging hardware
- Charging management software
- Installation, service and support

**Retail solutions**

- Advanced automation platforms
- Frictionless retail

**Dispensing solutions**

- Gilbarco Veeder-Root heritage
- Large global install base

**Alternative fuelling**

- Wide range of alternative fuelling solutions
- CNG, LNG, AdBlue, Biodiesel
- Hydrogen

**Payment solutions**

- Outdoor payment technology
- Mobile payment

**Underground tank monitoring**

- Veeder-Root tank gauging systems and probes
- Remote wetstock monitoring

**GILBARCO VEEDER-ROOT**

**Over 150 years' experience**

**Comprehensive service & support**

# Vontier Company Information

## Who is Vontier?



GLOBAL TRAFFIC TECHNOLOGIES

TELETRAC NAVMAN



 **8,800+**  
GLOBAL TEAM MEMBERS

 **530+**  
COMBINED YEARS INNOVATION

 **150+**  
GLOBAL LOCATIONS

**~700**  
ENGINEERS

 **2020**  
LAUNCH

 **20**  
MANUFACTURING FACILITIES

**1,800+**  
MATCO FRANCHISES

 **90,000+**  
GTT CONTROLLED INTERSECTIONS

 **41 of 50**  
TOP U.S. CITIES SERVED BY GTT

**US HUBS**  
GREENSBORO, NC  
GARDEN GROVE, CA  
NASHVILLE, TN  
ST. PAUL, MN  
STOW, OH,  
AKRON, OH

 **480,000+** VEHICLES MONITORED BY TELETRAC NAVMAN

**HQ**  
RALEIGH, NC

 **~\$2.7B** 2020 REVENUE

**> 260,000** RETAIL FUELLING CUSTOMER SITES

# ANGI/GVR Hydrogen Fueling Equipment

## Why Enter the H2 Market?

-  ANGI and GVR have been asked on numerous occasions over the years to develop Hydrogen fueling equipment, and now seemed to be the right time based on worldwide H2 activity and interest.
-  We carried out market surveys in North America and Europe, along with outreach to potential and existing Hydrogen station operators for Voice of Customer (VOC) in 2000; and based upon feedback, it was decided to enter the market.

# ANGI/GVR Hydrogen Fueling Equipment

## Selection of VOC feedback - 1

-  For the past 20 years, H2 equipment has primarily been supplied by companies whose expertise is outside of retail fueling equipment manufacturing or fueling station operations.
-  H2 stations have typically been designed without focus on redundancy and serviceability, causing stations to be down regularly resulting in a fueling network with low uptime.
-  Customers want designs with configurability or modularity.

# ANGI/GVR Hydrogen Fueling Equipment

## Selection of VOC feedback - 2

-  Availability of components is a challenge; lead times are too long.
-  Permitting, approvals and certifications are taking too long to complete.
-  H2 market is currently too reliant on government funding.
-  Market not growing rapidly enough; lack of hydrogen vehicles is contributing to this.

# ANGI/GVR Hydrogen Fueling Equipment

## Selection of VOC feedback - 3

-  Need for a supplier to provide a dispensing solution with: (1) capability to interface with a broad range of compression packages and ancillary equipment, and (2) a payment solution with the required processing for each market/end customer.
-  Need for a supplier to provide the whole station scope, and not have to purchase individual components from different suppliers.
-  Equipment costs are too high.

# ANGI/GVR Hydrogen Fueling Equipment

## ANGI/GVR reaction to VOC - 1

-  ANGI/GVR will leverage practices and experience from other successful fueling businesses like CNG, Gasoline, Diesel, DEF etc. to develop a true and reliable retail experience utilizing both existing and new technologies in our products.
-  This will include such features as integrated payment systems, remote communication and monitoring and interfacing capability, along with configurability and modularity.

# ANGI/GVR Hydrogen Fueling Equipment

## ANGI/GVR reaction to VOC - 2

- 🌀 We consider the lack of redundancy is due to two main reasons:
  - Cost of equipment – component costs are extremely high due to the pressures required for fueling (it is not linear increase, but more of an exponential increase as pressure increases from 350 bar to 700 bar).
  - Inexperience in compressed gas refueling strategies resulting in inefficient designs and low consideration for redundancy.

# ANGI/GVR Hydrogen Fueling Equipment

## ANGI/GVR reaction to VOC - 3

-  We believe equipment costs and lead times are high due to the very high pressures, custom nature of the components, limited number of worldwide component manufacturers and low quantity purchases.
-  To combat this ANGI/GVR are designing a single solution to serve both North America and Europe with as many common components as possible to allow quantity purchases, but .....

# ANGI/GVR Hydrogen Fueling Equipment

## ANGI/GVR reaction to VOC - 4

-  ANGI and GVR believe that component prices will only start to drop significantly as the market size increases.
-  We believe permitting and approval times will get better as more projects are completed; but feel that some type of training should be initiated for the permitting/approval bodies as this will reduce times by providing standardized requirements to simplify the whole process.

# ANGI/GVR Hydrogen Fueling Equipment

## ANGI/GVR reaction to VOC - 5

-  Additionally, better access to testing apparatus and labs would also help improve permitting and approval times.
-  If government funding were to be removed, we believe that the market ramp up curve would stall. The increased expansion of H2 stations is needed to help reduce costs and produce stations which provide ROI for the businesses, after which government funding would not be needed.

# ANGI/GVR Hydrogen Fueling Equipment

## ANGI/GVR reaction to VOC - 6

-  The CNG market was once in a similar situation to the current hydrogen market, with non-standard equipment, long permitting times, lack of OEM vehicles, funding and ROI concerns etc.
-  We went through the “growing pains” to become a viable alternative fuel industry – which is even more viable now with the use of RNG to significantly cut emissions – so if the hydrogen industry learns from NGVs, things should improve over time.

# ANGI/GVR Hydrogen Fueling Equipment

## Dispensing Solutions – Benefits at a Glance

### Best-in-class dispensing solution, complemented by our extensive automation and service platform

All the comfort and familiarity needed to help end users embrace hydrogen, whilst integrating seamlessly and safely into your business.

#### For your customers



##### Familiar look and feel

Hydrogen is a new fuel with a different fueling journey. Our goal is to make the refueling process as easy, familiar and interactive as possible.



##### Safe to use

GVR's long history of safety continues – Our H2 dispenser fully isolates the customer from hydrogen through superior hanging hardware.



##### Frictionless

Drivers will have a choice of payment or authentication methods for their convenience. For retail applications, our H2 dispenser can be fully enrolled in the retailer's loyalty/promotion ecosystem.

#### For you



##### Brand awareness

Hydrogen dispensers are a powerful branding device that also promote corporate sustainability credentials and future vision.



##### Plug & play

No need to modify existing architecture: our H2 dispenser will be able to drop into the forecourt as-is and is easily integrates into site management and automation systems.



##### Always online

Designed with ease of maintenance & calibration top of mind. Enjoy superior uptime, backed by our extensive service network and remote monitoring capabilities.



# ANGI/GVR Hydrogen Fueling Equipment

## Dispensing Solutions – Key Features

### Versatile solution

Highly configurable with choice of 35 or 70 MPa, single/dual sided, one/two hose(s) per side, and lane or island-oriented.

### Plug and play

Utilizes established communication protocols such as Gilbarco 2 wire or IFSF. Easily integrates into point-of-sale, site management and automation systems.

### Comprehensive design

Up to two complete fueling positions in only 'one box': integrated payment, chilling, metering, flow control, and fueling algorithm according to SAE J2601 or J2601-2 protocols.

### Easy serviceability for high uptime

Easy access maintenance panels and large hydraulic frame.



Island Oriented Dual Hose  
H-frame Dispenser



Lane Oriented Dual Hose  
C-frame Dispenser

### 1 Integrated payment

EMV ready payment terminal supports a wide range of payment methods as well as fleet cards and loyalty schemes.

### 2 Web-enabled

For remote diagnostics, predictive and preventative monitoring and maintenance.

### 3 Modern display

Large 15" multimedia screen displaying prices, masses as well as advertising and instructional video content.

### 4 Customizable branding

Optional branded cabinet doors, hose column and canopy.

# ANGI/GVR Hydrogen Fueling Equipment

## Compressing Solutions – Benefits at a Glance

BENEFITS AT A GLANCE	
<b>Expertise</b>	Combined 75 years' compression experience
<b>Efficiency</b>	Energy efficient design
<b>Flexibility</b>	Different configurations to support 10-500 bar suction pressures of hydrogen
<b>Scalability</b>	Modular design, expandable over time
<b>Uptime</b>	Full range of aftersales services including remote support
<b>Integration</b>	Plug and play solution, integrates with site control/automation
<b>Safety</b>	Safety interlocks, leak detection, emergency shutdown, NFPA 2 compliant



Based on the PDC 4 and 13 series, our containerized solution features all the efficiency and performance of PDC's state-of-the-art compression technology

# ANGI/GVR Hydrogen Fueling Equipment

## Compressing Solutions – Key Features

### BUILT WITH SERVICEABILITY & UPTIME IN MIND

<b>Enclosure</b>	Plug and play design, facilitates coupling of multiple units.
<b>Manoeuvrability</b>	Fork pockets to base <b>1</b> , top lifting points for crane jib <b>2</b> .
<b>Easy access doors</b>	Wide concertina door to access compression block <b>3</b> , Separate double doors to access electronics/controls <b>4</b> .
<b>Web-enabled</b>	Internet connectivity <b>5</b> for remote monitoring and preventative maintenance.

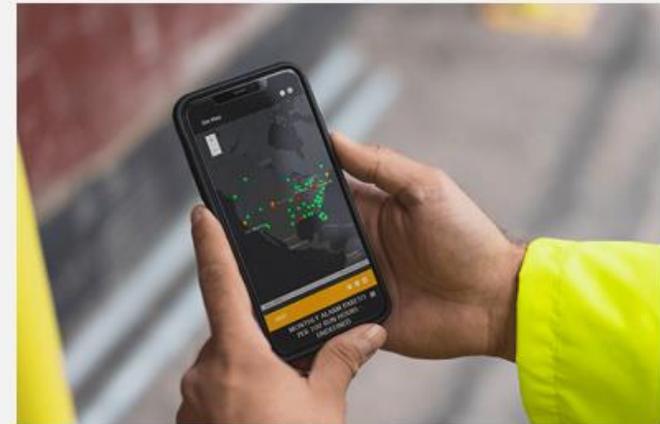


# ANGI/GVR Hydrogen Fueling Equipment

## Remote Management Software

### Real-time Portal and App

- ✓ **24/7 remote access:** Check status of your station equipment, from anywhere, at any time.
- ✓ **Actionable insights:** Real-time & historical insight to equipment performance, maintenance contractor performance, and predictive analytics
- ✓ **Improve efficiency and control costs:** Improve uptime, speed up emergency alarm responsiveness, track and audit third-party maintenance work, and ultimately, lower TCO and bottom-line costs.
- ✓ **Customizable solution:** We will work with you to configure the platform and reporting to suit your needs.



# ANGI/GVR Hydrogen Fueling Equipment

Focus. Innovation. Experience.

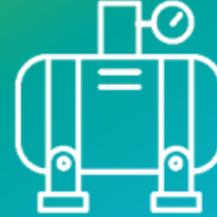
**#1**

Industry leader in  
retail fuel market



**30+**

Years of compressed  
gas experience



**150+**

Years of fueling and user  
interface innovation



**270+**

Service & Support  
Technicians



**600**

Development  
Engineers



**5,500**

Employees





# THANK YOU

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