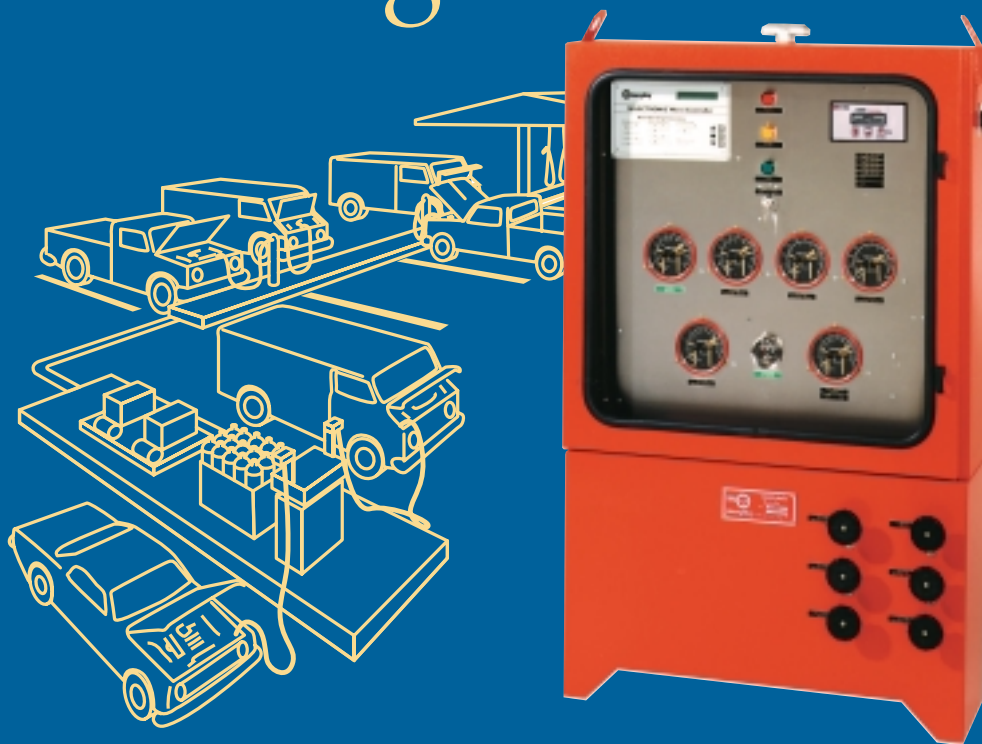


F W M u r p h y

Control Systems for Alternative Fuel Fueling Stations



←murphy™



Continuing a Tradition

FWMurphy has been in the business of providing quality controls to the engine, pump, and compressor market since 1939. Most of the controls in use today were pioneered by Murphy to meet the needs expressed by OEM's, packagers and users. As we move into a renewed era of environmentally clean burning Alternative Fuels,

We understand your requirements, we listen to your concerns, and most importantly, we respond.

with Compressed Natural Gas (CNG) leading the way, Murphy again is out in front with new control systems. This fast growing market requires combining the best of our proven controls with the innovative SELECTRONIC® Micro-Controller™ units. Murphy engineers are able to provide well designed systems to meet your exacting needs.

Our LEVELS I, II, and III control systems have been engineered to cover a wide variety of requirements from simple start/stop operation of the compressor and driver to complete station automation with remote communication capabilities. Should these standard systems or options not cover your system requirements, these controllers have the capability to be expanded or engineered to meet your needs.

We understand your requirements, we listen to your concerns, and most importantly, we respond. Murphy controls are known and accepted world-wide, and they are backed by our limited 2 year warranty.



All Murphy controls are designed to live in the harsh environment of motors, engines and compressors.

They're tough for tough applications. These systems are designed and built in accordance with NFPA 52 and NFPA 37 guidelines to meet the area classification requirements as defined by the National Electric Code.

Whether you are upgrading existing equipment or specifying a new installation, give your equipment the Murphy Advantage. You will add value to your equipment and gain increased customer satisfaction. Specify Murphy LEVEL I, II, or III SELECTRONIC® control systems for your Alternative Fuels Fueling Station control requirements.

NOTE: The features shown for LEVELS I, II, and III are typical for intended applications. Exact configuration and availability of features may depend upon final system requirements.



Standard Control Systems for CNG Fueling Stations

LEVEL I Designed for the small fueling facility...monitoring and controlling electric motor driven compressor.

LEVEL I is an entry level controller system designed for the small fueling facility requiring only basic start and stop of the compressor and monitoring basic shutdown functions. It monitors and controls the electric motor driven compressor and the system loading and unloading devices.

The LEVEL I controller is an extremely powerful system, yet user friendly. Its design incorporates the high technology Murphy SELECTRONIC® Micro-Controller™ series.

Features:

- ▶ Automatic start and stop control
- ▶ Operating parameters field adjustable without reprogramming
- ▶ Includes hourmeter
- ▶ Extremely user friendly
- ▶ Operates load/unload devices
- ▶ Compatible with stand alone priority/sequential controls (see below)
- ▶ NEMA 4, 7, and 9 enclosure

Additional Controls

Stand Alone Priority and Sequential Controller

The Murphy SELECTRONIC® Priority/Sequential Controller will monitor the *Cascade* or other high pressure storage banks and control the electric sequencing valves. The *Priority Valves* will sequence at operator selectable levels to fill the

storage on fast fill packages. It will also monitor the vehicle dispenser flow rate and pressure, and will control the *Sequential Valves* and *Shut-off Valves* to maximize filling the vehicle in the minimum amount of time.





LEVEL II

Suitable for larger stations with simplex or duplex compressor(s).

LEVEL II is a mid-range system designed for the larger stations with more shutdown inputs being monitored than the LEVEL I control system. The LEVEL II system performs all the functions of the LEVEL I, plus is available for both single or dual electric motor or engine drive applications. A SELECTRONIC® Micro-Controller™ monitors control functions and displays status and faults in a two line alphanumeric LCD display. By selecting the appropriate Murphy SELECTRONIC® Micro-Controller™ for the specified hazardous area classification (Div. 1 or Div. 2), non-explosion-proof end devices can be used. The LEVEL II controller is housed in a NEMA 3 weatherproof enclosure.

Features:

- ▶ Automatic start/stop control for electric motor or engine driver(s)
- ▶ Available for NEC Class I, Division 1 or Division 2, Group D
- ▶ Reliable microprocessor-based control circuitry
- ▶ Operates load/unload devices
- ▶ SWICHGAGE® instruments included in control panel
- ▶ Includes hourmeter
- ▶ Accepts discrete analog inputs
- ▶ Tachometer on engine drive units
- ▶ Operating parameters field adjustable without reprogramming
- ▶ Expandable to interface with multiple compressors or multiple station controls
- ▶ RS485 communications port
- ▶ Wide variety of optional features
- ▶ Extremely user friendly
- ▶ 12, 24 VDC or 120 VAC power required
- ▶ Compatible with stand alone priority/sequential controls (see page 5)
- ▶ NEMA 3 enclosure





LEVEL III

Monitor and control the entire fueling system including the Priority/Sequential valve operations. Communications modem on-board.

LEVEL III is a comprehensive system designed to monitor and control the entire fueling system. It is available for both simplex or duplex electric motor or engine driven systems.

The Murphy ELECTRONIC® Micro-Controller™ sequentially controls the compressor operations. It also controls the *priority valves* to maintain adequate storage pressure and the *sequential valves* which ensure maximum fill in minimum time.

A built-in temperature compensator assures optimum fills.

Remote communication is possible through the optional modem.

The LEVEL III is extremely flexible, user friendly and can be expanded to cover a wide range of CNG fueling facilities.

The LEVEL III control system is rated for hazardous and non-hazardous locations.



Features:

▶ PLC capabilities:

- ▶ 120 VAC control circuit for customer supplied motor contactor
- ▶ Available for areas rated NEC Class I, Division 1 or Division 2, Group D, and non-hazardous locations
- ▶ Automatic start/stop control for electric motors or engine drivers
- ▶ Monitor 40 optically isolated discrete inputs
- ▶ Provides 32 open collector outputs

- Operating parameters adjustable via three button operator key pad—no programming needed
- Built-in security to prevent unauthorized system parameter manipulation
- Operating parameters stored in EEPROM—memory maintained during power outage

- ▶ Monitor 20 analog inputs
- ▶ Reliable microprocessor based control circuitry
- ▶ Built-in, two-line alphanumeric display
- ▶ Operates load/unload devices
- ▶ Includes hourmeter
- ▶ Control of Priority and Sequential Valves
- ▶ Tachometer on engine drive units
- ▶ Expandable to interface with multiple compressors, pumps, vaporizers, or multiple station controls
- ▶ RS485 and RS232 communication ports
- ▶ Optional modem
- ▶ Temperature compensation
- ▶ 24 VDC or 120 VAC power required
- ▶ NEMA 3 enclosure

LEVEL III Simplex



LEVEL III Duplex





Custom Valve Panels

Priority/Sequential Valve Panels

Murphy offers Priority/Sequential Valve Panels complete with Murphy Pressure Transmitters for use with the LEVEL III control system or the Murphy Stand-Alone Priority/Sequential Controller. These panels were designed to fail close valves for optimum operation. These panels can be provided on a plate or in a free standing NEMA 3 weatherproof enclosure.



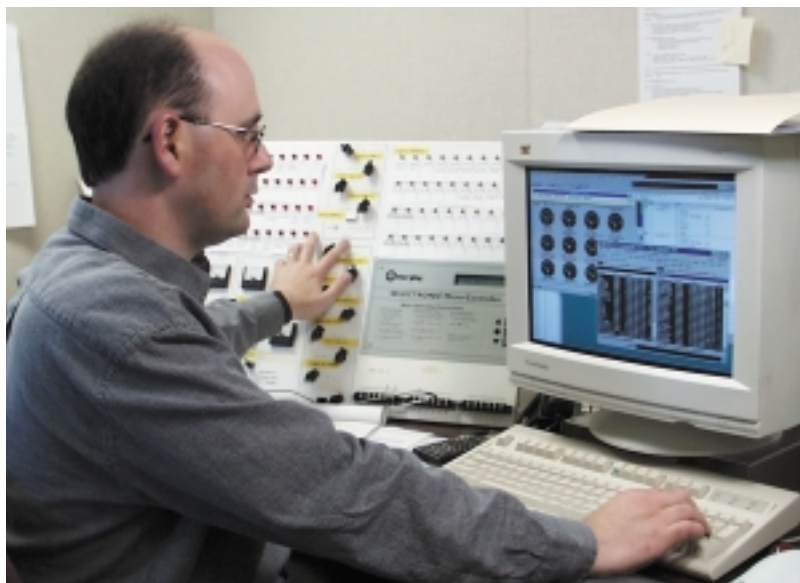
Valve Panel for 2 fast fill drops, 1 slow fill header, and 3 bank cascade storage.



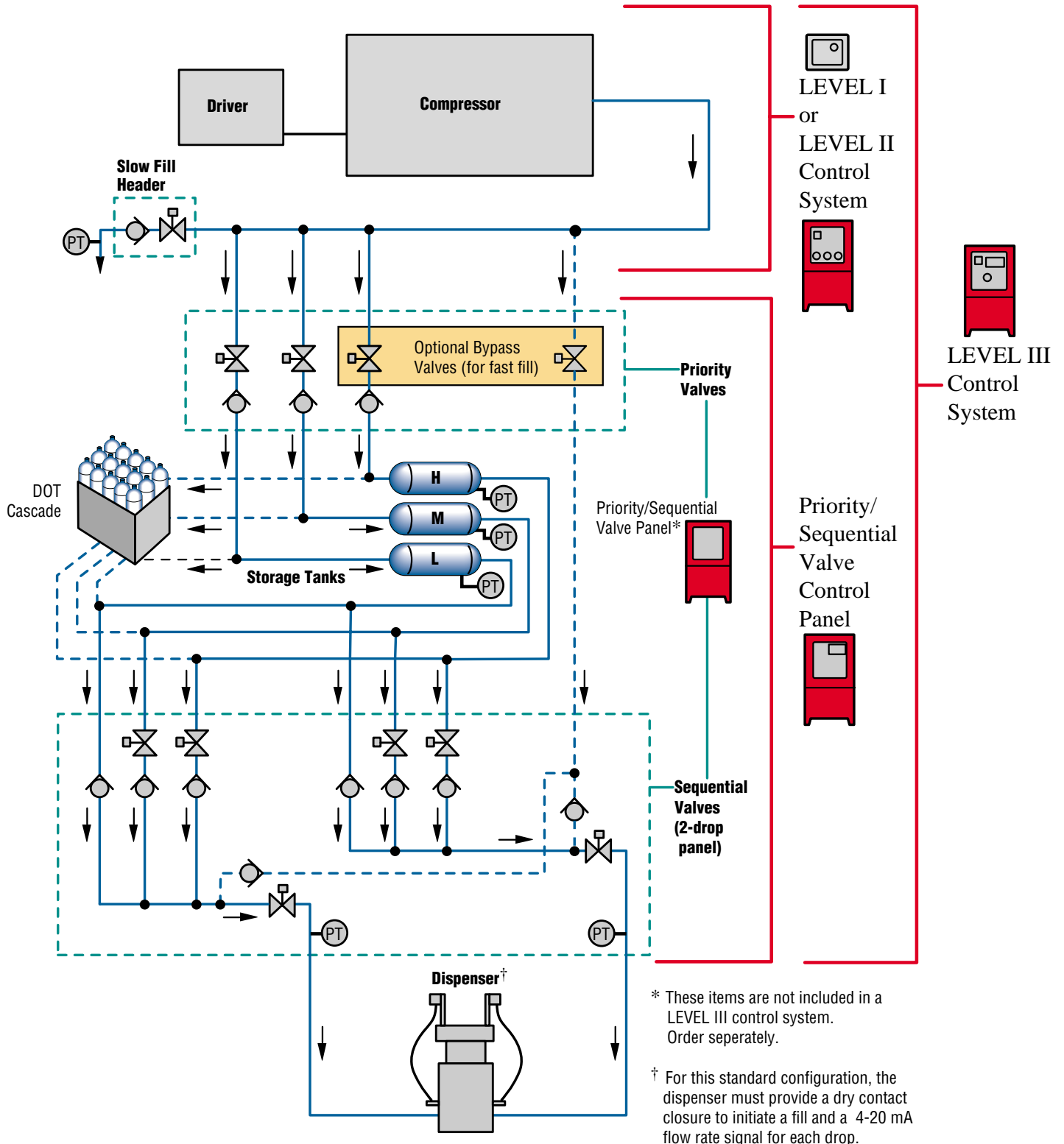
Valve Panel for 4 fast fill drops, 1 slow fill header, and 3 bank cascade storage.

Retrofit and Service Support

Murphy strives to offer the most effective and timely support in the industry. Whether your needs are panel service, re-programming or complete system upgrades using dependable and proven Murphy equipment, our qualified staff is eager to assist.



Layout of Typical CNG Fueling Station



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