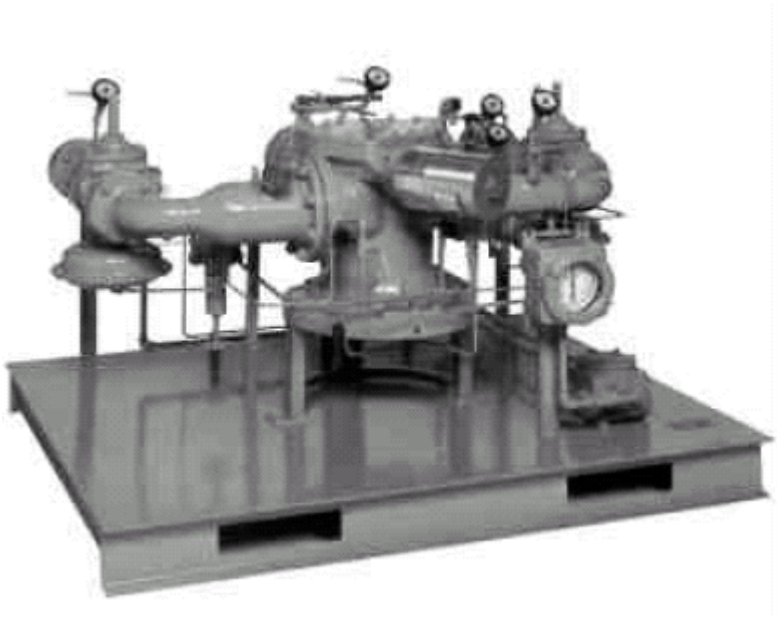
Blendaire™/FVO High Pressure LPG/Air Mixing System



The **BLENDAIRE FVO** is designed to accurately mix LPG vapor with air over a wide range of ratios and deliver the mixed gas at a fixed designated pressure from 10 to 150 psi (0.70 - 10.55 kg/cm2). The Blendaire FVO's floating variable orifice valve make it specifically suited for high mixing accuracy and high discharge pressures without relying on instruments that are susceptible to calibration errors, electrical noise, or program faults.

The Blendaire FVO principle of operation is based on maintaining a constant ratio between the pressure drops across an air orifice and a gas orifice. Interconnected regulators on the gas and air inlets maintain constant and equal pressure while the mixing valve adjusts the vertical orifice opening as the flow rate changes. Rotating the piston either manually or automatically with the ARA feature changes the mixing ratio.

There are two separate flow paths into the **BLENDAIRE FVO**, one for air and one for LPG vapor. They combine at the mixing valve into a single mixed gas line. The gas governor is slaved to the air regulator. Since the two regulators are mechanically linked, the air pressure and gas pressure entering the mixing valve is equal.

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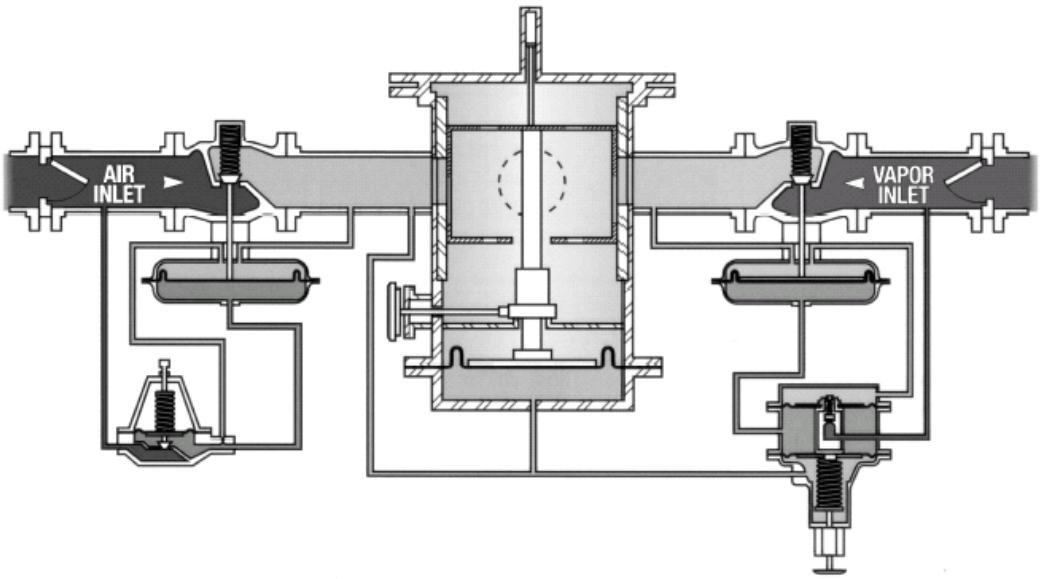


The air regulator also delivers control pressure to the diaphragm-actuated piston and controls the gas governor through a common sensing line. Consequently, regulated air pressure, regulated LPG vapor pressure and mixed LPG/Air pressure remain constant.
If there is a malfunction, the safety shut-off valve(s) and the two regulators will shut down the system.

Automatic Ratio Adjustment (ARA) Feature

The ARC system utilizes a state-of-the-art PID Loop Control system. The system is fully factory programmed but can be individually tailored to fit the specific characteristics of each application. The control loop consists of **a HIGH SPEED WOBBE INDEX ANALYZER**, a PID loop controller and a multi-turn gear reduction variable speed Servo Motor (explosion-proof). The motor mounts directly to the mixing valve and positions the internal port sleeve via a threaded shaft. The motor can be removed from the **BLENDAIRE** without harm to the system during operation. Flammability limit stops are set within the controller to limit the mixing ratio within the safe range.

SYSTEM OPERATION:

The output from the **HIGH SPEED WOBBE INDEX ANALYZER** is compared to the set point in the PLC. Based on the trend, the PLC sends a signal to the Servo Motor, increasing or decreasing the ratio of LPG to air. As the Servo Motor changes the port position, the calorimeter senses the change in mixture ratio. Meanwhile, the controller senses the amount and rate of change and dampens the loop. After auto tune has been initiated, the controller can predict system response to minimize and dampen the cycle frequency and amplitude to optimize performance.

The ARA system automatically adjusts the ratio of LPG to air to maintain a consistent gas quality within +/-1.5% or better.

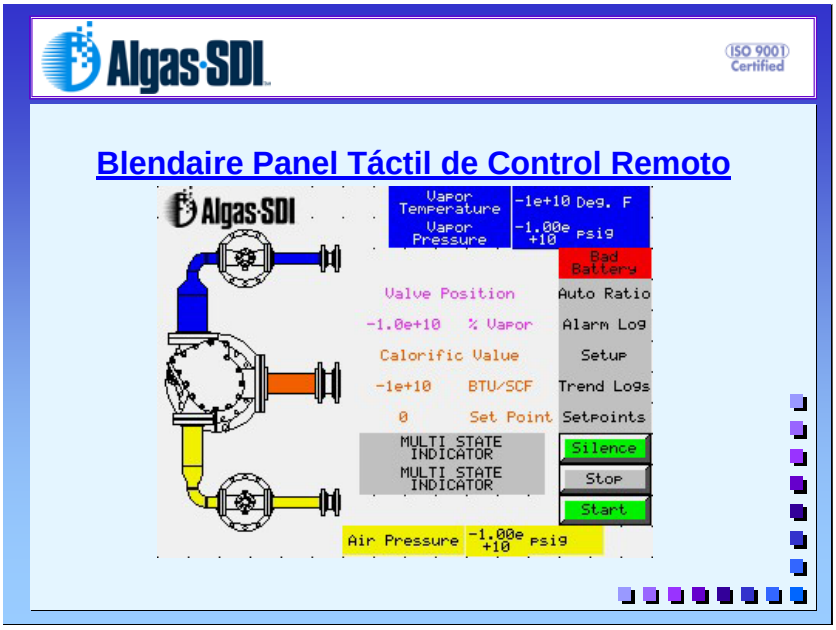
MIXER FEATURES:

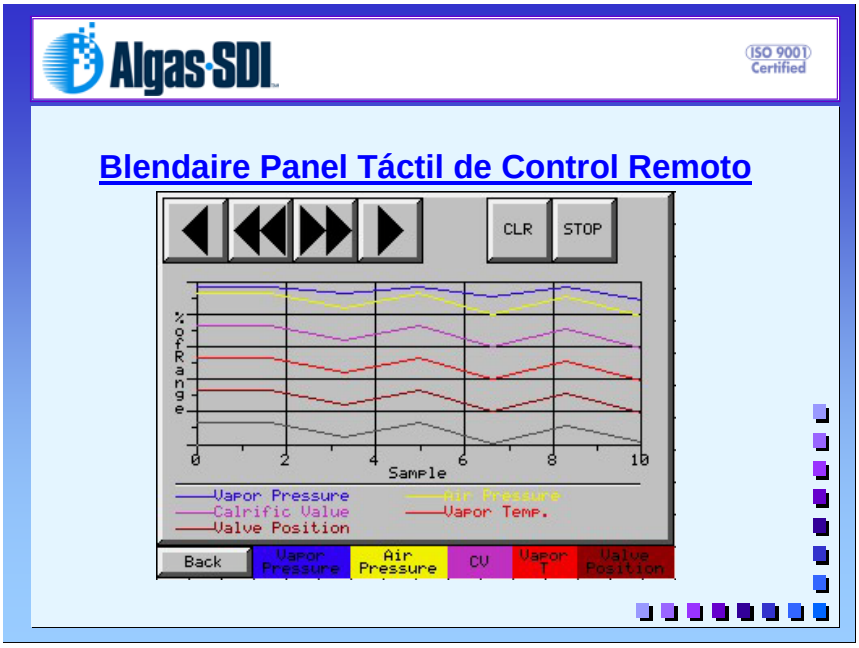
- Three port mixing valve with floating variable orifice piston provides smooth and accurate operation at all flow rates
- Anodized sleeve ensures tight tolerances between interfacing surfaces. Only two surfaces interface (the outer piston surface and sleeve surface). The sleeve does not move and the piston travels on shaft via bearings.
- All valve motion is via bearings, no sliding motion.
- Rack and pinion ratio adjustment for precise valve position.
- Diaphragm controlled system instead of a labyrinth design.
- Self cleaning piston
- All outer surfaces are nickel-plated meaning corrosion resistant.
- The valve is designed to an explosion proof configuration.
- NG side is slaved to the air side for safety and smooth operation.
- Differential pressure switch shuts unit down if differential pressure is too high
- Differential pressure indicator allows operator to verify proper operation
- Visual indicators show valve position – mixing ratio and piston travel.
- All pipe is welded and flanged, no threaded connections.
- Skid-fully covered, full plate provides easy/safe access
- Chamfered skid edges prevent shin and leg injuries
- Mixer configuration satisfies NFPA standards as a Class I, Division 1, Group D unit.
- Unit complete with all necessary safeties

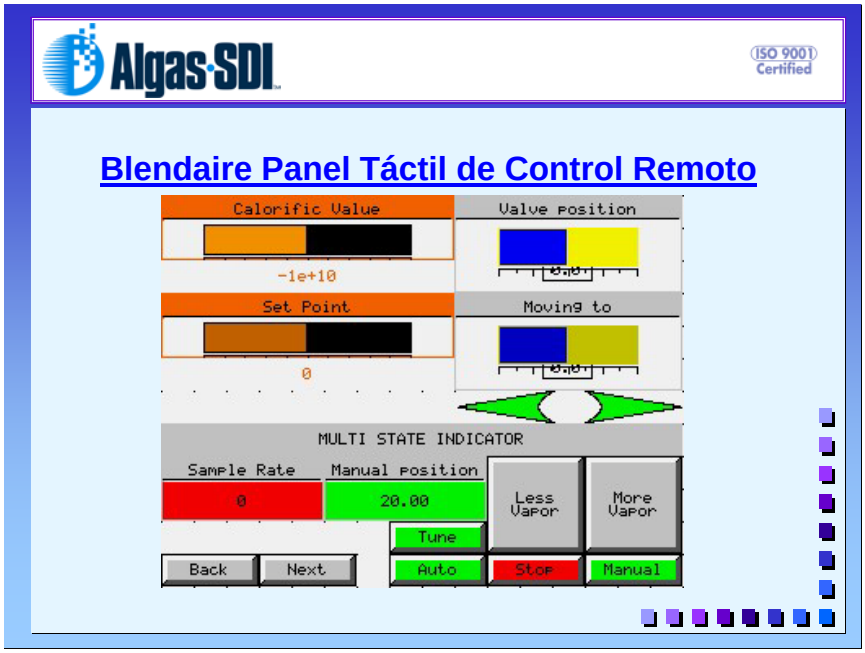
REMOTE TOUCH SCREEN CONTROL PANEL

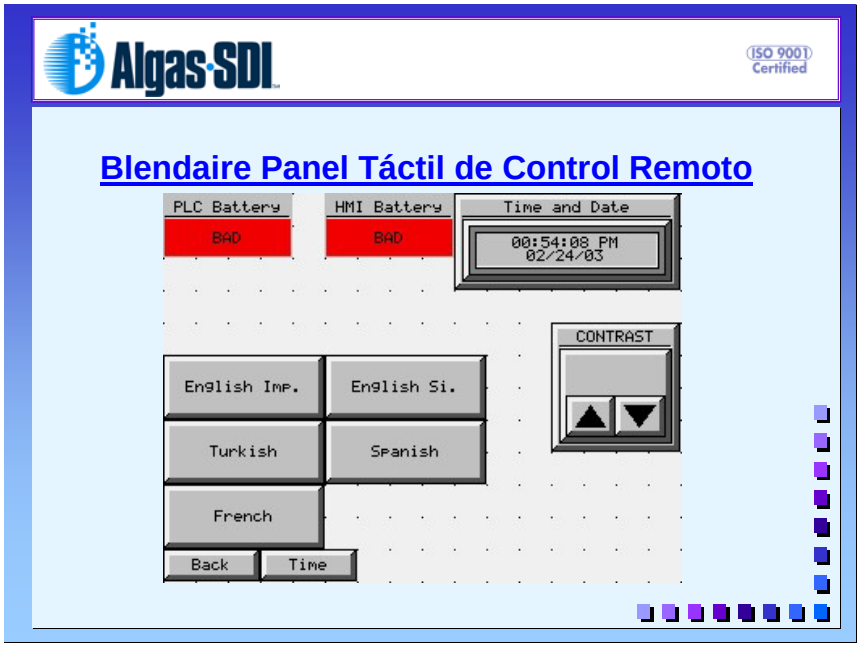
- Incorporates the latest technology with HMI (Human Machine Interface) touch screen panel and PLC control.
- Controls with the universal language, Modbus, so existing and future control systems can easily communicate.
- The touch screen includes a trending package, an alarm log and a real time clock.
- The programming allows for two tiered alarm and shutdown. A PID with automatic tune, allowing the customer to automatically tune the system is also included.
- All outputs are analog based for real time monitoring-makes it easier to set, adjust and ensure proper operation.
- Feedback transmitter-indicates the exact position of motor and allows customer to easily monitor the position of the valve. The operator can easily set the valve position as desired.
- Calorific value or Wobbe dead band is adjustable for tighter tolerance.
- Scaling for all transmitters is adjustable.
- Panel configuration is general purpose, for non-hazardous area location

Please see some sample screens below:






Algas-SDI
ISO 9001 Certified
Blendaire Panel Táctil de Control Remoto
Calorific Value
-1e+10
Valve position
Set Point
0
Moving to
MULTI STATE INDICATOR
Sample Rate
0
Manual position
20.00
Less Vapor
More Vapor
Tune
Back
Next
Auto
Stop
Manual


Algas-SDI
ISO 9001 Certified
Blendaire Panel Táctil de Control Remoto
PLC Battery
BAD
HMI Battery
BAD
Time and Date
00:54:08 PM
02/24/03
CONTRAST
English Imp.
English Si.
Turkish
Spanish
French
Back
Time