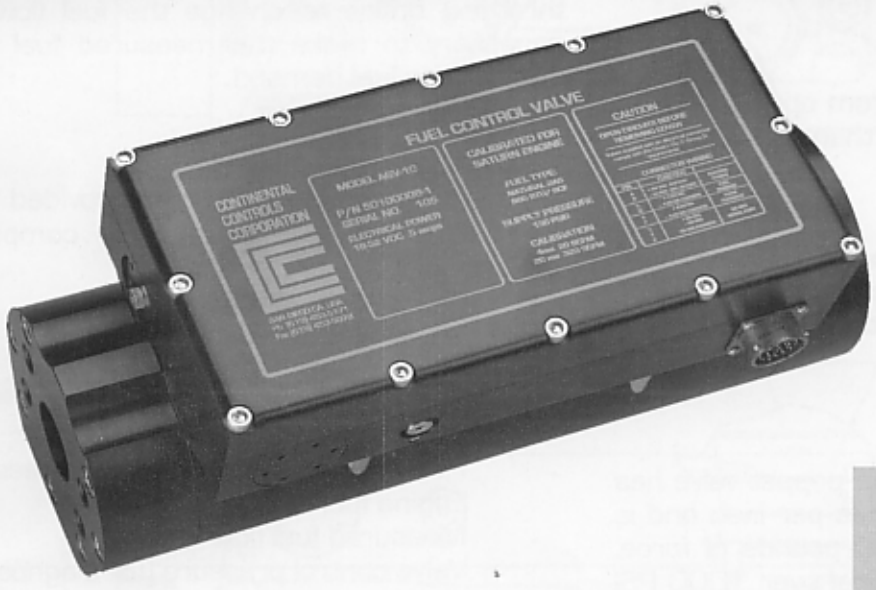
CONTINENTAL CONTROLS CORPORATION

GAS FUEL METERING VALVE

FOR METERING GAS FUEL TO LIGHT INDUSTRIAL GAS TURBINE ENGINES



Model AGV10

APPLICATION

The **AGV10 Valve** is used to meter gas fuel to gas turbine engines in the horsepower range of 850HP to 5000HP, with only minor differences within the valves to accomodate the range in flow. The valve has been designed to provide an optimum interface between a PLC Control system and a gas turbine engine. The valve is linear, in that the metered fuel flow is proportional to the 4- 20 ma fuel demand signal from the PLC.

The valve has exceptionally fast response and can provide outstanding transient performance when used in a generator application. It will also provide superior engine performance in any mechanical drive application

The high accuracy of the valve in the start fuel range assures the engine will have excellent light off and consistent starting characteristics.

The use of the valve greatly simplifies the on skid gas system plumbing and wiring.

The valve is certified by CSA for Class I Division 1 or 2 use.

RELIABLE STARTING

ROBUST & DURABLE

DIRT TOLERANT

IMPROVED ENGINE PERFORMANCE

BUILT-IN FLOW METER

ALL ELECTRIC

LOW POWER 24VDC, 1 AMP

IDEAL FOR USE WITH PLC SYSTEMS or CCC BLACK BOXES

COMPUTER BASED

DESIGN FEATURES

requirements for use in hazardous environments.

EXCELLENT START RELIABILITY
Eliminates fuel system related starting problems, even under the most adverse conditions because the valve precisely controls the fuel flow with flow meter accuracy.

VERY FAST RESPONSE
The valve will transition from open to closed or closed to open in less than 50ms.

SPEED STABILITY
There are no through-the-wall seals or other internal points of friction that cause speed instability. Engine operation is smooth and steady.

HIGH FORCE
The spring that closes the poppet valve has a spring rate of 96 pounds per inch and is pre-loaded closed with 60 pounds of force. This produces a pressure of over 1000 PSI on the resilient valve seat to assure a positive shut off.

LOW POWER
The valve is powered from a 24VDC battery source. The current required is <1 amp.

HIGH DIRT TOLERANCE
The flow-through design minimizes the effects of particulate contamination. Dirt normally found in pipeline applications passes through and does not collect in the valve. An internal 11 micron filter is included to prevent particles from entering the pilot stage.

FAIL SAFE
The main poppet valve is spring loaded closed. It closes on loss of power, loss of gas pressure, and diaphragm failure.

BUILT-IN FLOW METER
The Fuel Valve includes an Orifice Flow Meter for measuring fuel flow. The Fuel flow measurement is available to the user for display and logging purposes.

COMPUTER CONTROL
The control of fuel flow is performed by an electronic computer assembly. The computer receives the 4 - 20 ma fuel demand signal and compares it to the fuel flow signal from the built-in flow meter. It then adjusts the throttling orifice to change the fuel flow as necessary to make the measured fuel flow equal to the fuel demand.

SERIAL PORT
An RS-485 Serial port is provided for interfacing the valve with other computer systems .

The data available includes:

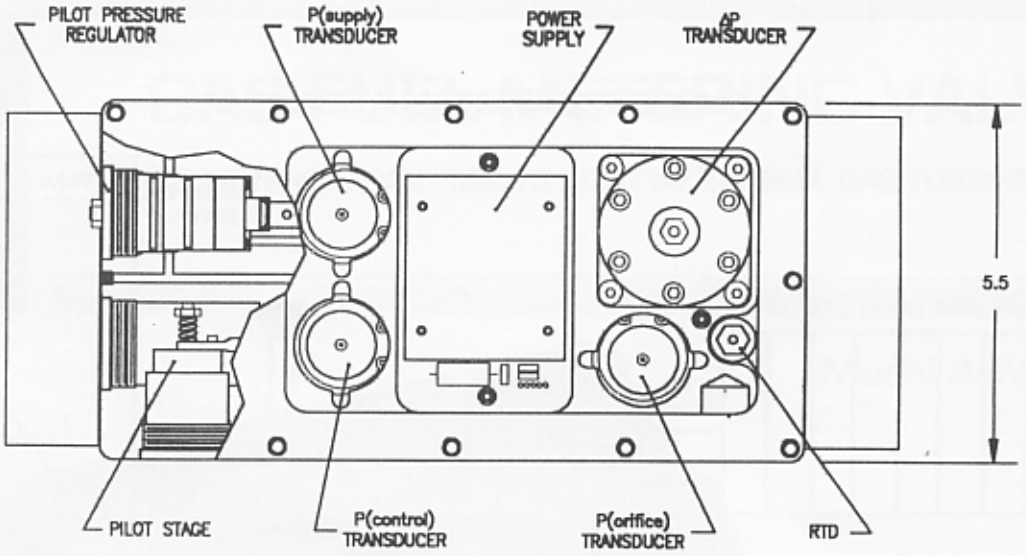
- Fuel supply pressure
- Fuel temperature
- Flow meter orifice differential pressure
- Engine fuel manifold pressure
- Measured fuel flow
- Valve control pressure (for diagnostic use)

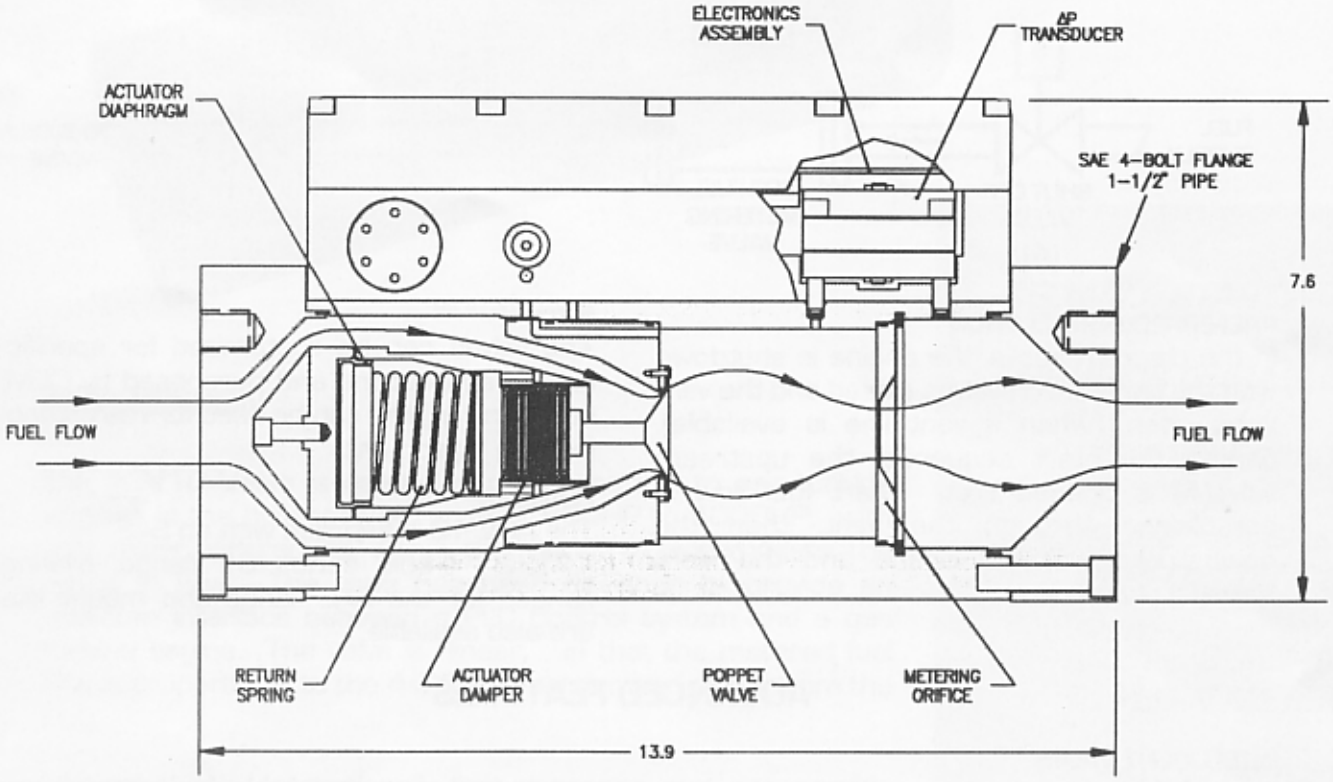
MULTI LOOP CONTROL CONCEPT
The valve assembly contains an in-line poppet type, throttling orifice followed by the orifice used for flow measurement. The main poppet valve is pressure balanced and spring loaded closed with a high pre-load. Control gas pressure applied to a diaphragm, provides the force to open the valve.

The valve has two control loops, one controls the "control gas pressure", which is used to actuate the main poppet valve. The stroke of the poppet valve is proportional to the control pressure. The other loop compares the gas flow to the fuel demand signal. If the gas flow is not equal to the fuel demand signal, a correction is made to the control pressure set point to bring the measured gas flow to the requested value. The result is a very accurate and fast means of flow control.

FUEL GAS SUPPLY PRESSURE
Pressure variation in the fuel supply does not affect the gas flow though the valve, providing the pressure does not drop below the minimum required for that fuel flow.

GAS VALVE CONSTRUCTION





VALVE CONSTRUCTION

The electronics and sensors are contained in control housing on top of the valve. The control housing is designed with flanges in accordance with the NEMA-7 requirements for use in a Class I, Division 1 area, for Group D gases.

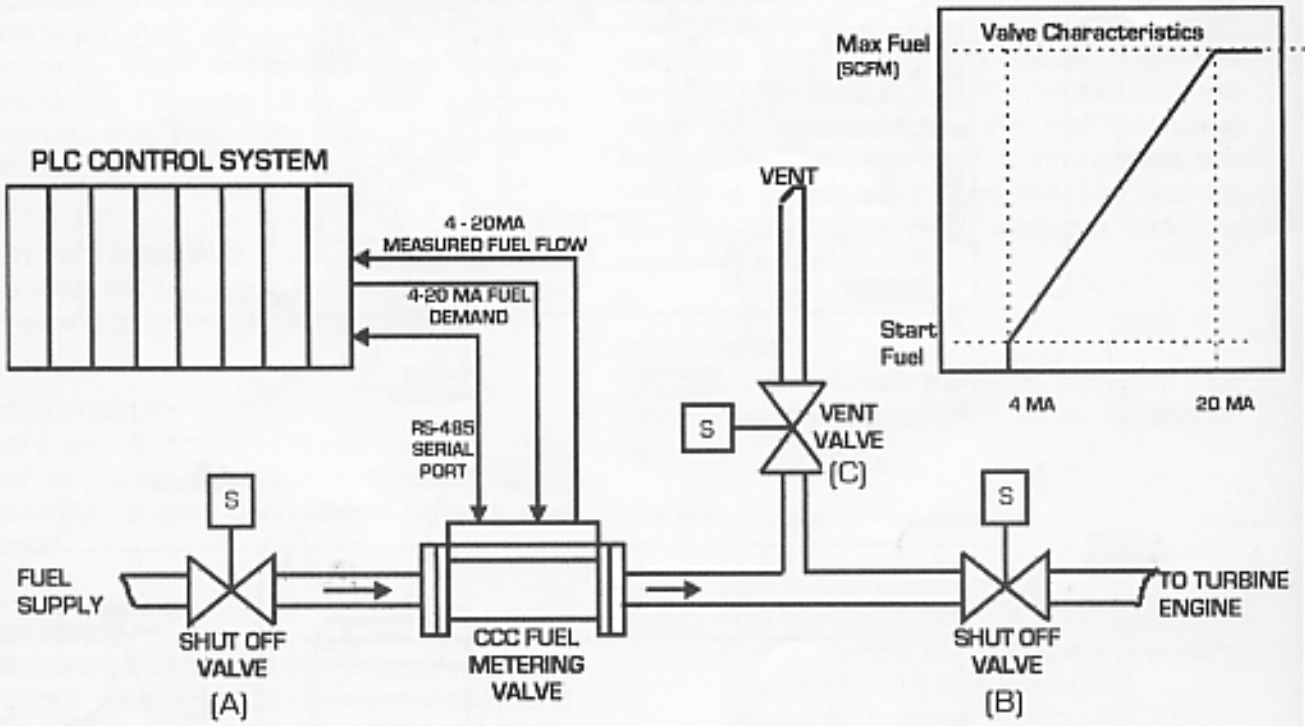
The printed circuit board assembly is not shown in the top view, so the main components of the assembly can be seen.

Metal tubes are used to communicate the pressures in the valve body to the sensors in the control housing.

CORROSION RESISTANCE

There are no electrical components in the gas stream, including the voice coil actuator. The materials exposed to gas are corrosion resistant and include; anodized aluminum, stainless steel, and Buna-N rubber. Super Viton is used for applications with sour gas.

SUGGESTED INSTALLATION



PREFERRED INSTALLATION

In the diagram above, the engine is shutdown with the two shut-off valves closed and the vent valve open, (when a vent line is available). During the start sequence, the upstream valve(A) is opened first, Start fuel flow is established through the vent, then the downstream valve(B) opens and the Vent Valve(C) closes.

APPLICATION

The valves can be customized for specific engine applications and purchased by OEM suppliers, or they can be used for retrofitting existing equipment.

FLANGES

The AGV 10 is supplied with an SAE 1 1/2", 4-bolt, series 61 flange. Mating flanges for the SAE flange and mount kits are also available.

ADVANCED FEATURES

INTELLIGENT VALVE

An imbedded computer makes the valve unique. It can be programmed to control the acceleration of the engine based on compressor discharge pressure. This provides the most reliable fuel control over the entire life of the turbine. Embedded acceleration can be used with CCC Black Boxes or with a PLC Control System.

CCC also manufactures electronic control systems, valves and other components for both gas and liquid fuels. Please contact us for your special requirements.

New Area Code: (858) 453-9880 • Fax (858) 453-5078

CONTINENTAL CONTROLS CORPORATION

6042 Cornerstone Court West, Suite B • San Diego, California 92121 USA

Phone (858) 453-9880 Fax (858) 453-5078

www.continentalcontrols.com e-mail@continentalcontrols.com