

Liquid Shutoff Valve

Applications

The Liquid Shutoff Valve is a three-way valve designed to rapidly shut off all liquid fuel flow and prevent leakage to the turbine. In the de-energized state, the valve diverts inlet flow to bypass ports, preventing pressure damage to positive displacement fluid systems.

Normal installation of the 21.5 pound (9.8 kg) valve is in the fuel line between the fuel regulating valve and the turbine.

The valve diverts flow from the discharge to bypass ports anytime the operating electrical signal is lost. The valve is available in four voltage configurations.

The valve is designed for a normal operating supply pressure of up to 1200 psig (8274 kPa) and has a rated flow of 30 000 lb/h (13 600 kg/h) (based on US MIL-C-7024 calibrating fluid at 70 °F/21 °C).

Description

The Woodward Liquid Shutoff Valve is a two-stage valve. It uses supply pressure to provide a complete shutoff of fuel flow in 0.09 seconds or less after termination of a solenoid current. Valve closure is due to spring compression assisted by supply pressure.

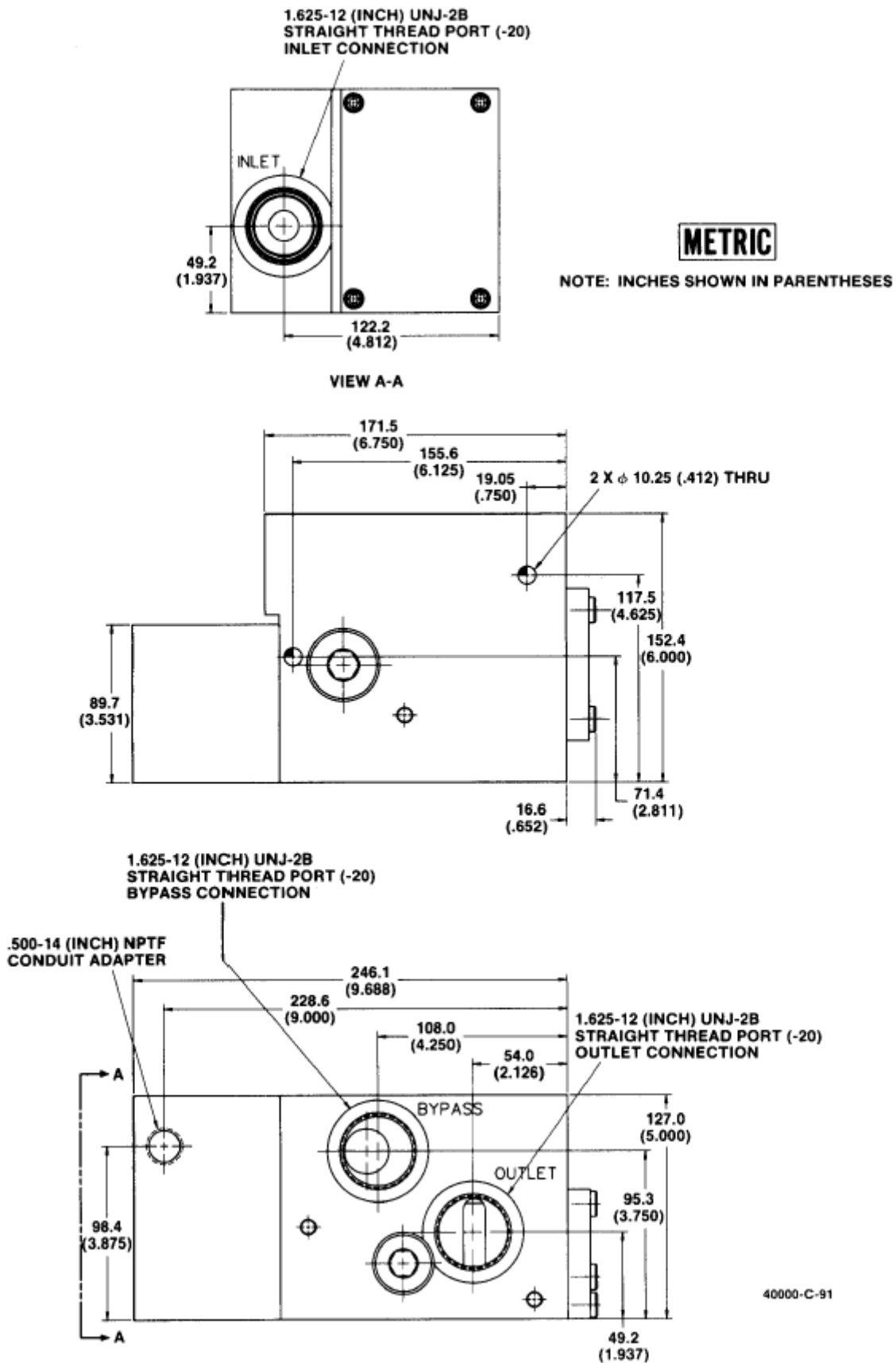
The valve is compatible with almost all fuels including diesel fuel, methanol, ethanol, Jet "A", kerosene, #2 home heating oil, heated light crudes, and residuals. The valve will accommodate contaminated fuels within prescribed limits.

An inlet screen in the valve prevents contaminants in excess of 40 µm nominal, from damaging the pilot valve section.

The valve housing is constructed of anodized aluminum. Hardened stainless steel is used for all internal parts. The valve is designed for proof pressures of 1800 psig (12 411 kPa) and burst pressures of 6000 psig (41 370 kPa).



- 30 000 lb/h (13 600 kg/h) rated flow
- Closes in 0.09 second
- 1200 psig (8274 kPa) maximum operating pressure
- Designed for use with diesel fuel, methanol, ethanol, Jet "A", kerosene, #2 home heating, and heated light crudes, and residuals



Outline Drawing of Liquid Shutoff Valve
(Do not use for construction)

Specifications

Electrical Requirements

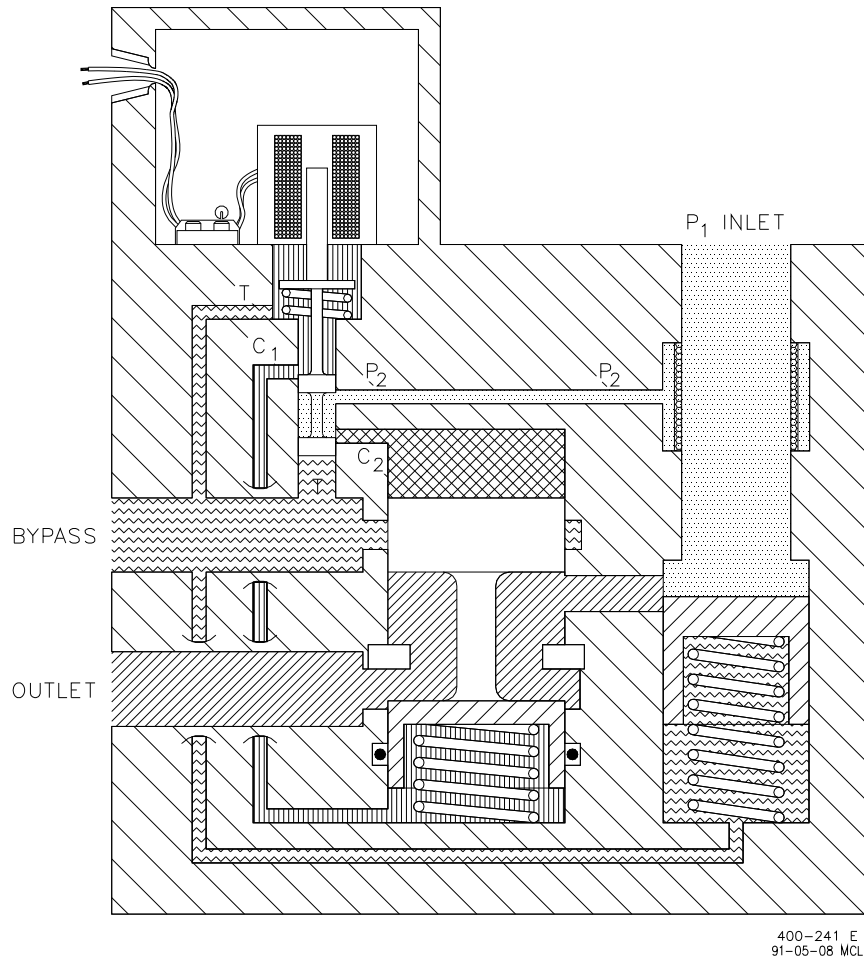
Voltage	Nominal 24 Vdc, 125 Vdc, available 115 Vac or 220 Vac
Power Consumption	20 W nominal
Resistance to Ground	50 M Ω minimum at 500 Vdc

General

Liquid Fuel	Diesel fuel, methanol, ethanol, Jet "A", kerosene, #2 home heating oil, heated light crudes and residuals
Fuel Temperature	0 to +250 °F (–18 to +121 °C)
Chemical Compatibility	Most typical fuels; call Woodward for special applications
Rated Flow	30 000 lb/h (13 600 kg/h) (base on US MIL-C-7024 calibrating fluid at 70 °F/21 °C)
Cycle Life	10 000 cycles
Weight	21.5 lbs (9.8 kg)
Construction	Anodized aluminum housing; hardened stainless steel internal components
Fittings	Fuel inlet, fuel outlet, and bypass threaded for SAE-type internal straight thread –20, 1.625-12
Electrical	0.500-14 NPTF conduit connector with 10 feet (3 m) of insulated conductor for field wiring

Operating Specifications

Opening Time	Maximum of 1.000 second after admission of fuel and solenoid current
Closing Time	Within 0.09 second after the solenoid is de-energized
Pressure Drop	53 psid (365 kPa) inlet to discharge at 30 000 lb/h (13 600 kg/h) 90 psid (621 kPa) inlet to bypass at 30 000 lb/h (13 600 kg/h)
Internal Leakage: Shutoff	From inlet to discharge: None. From inlet to bypass: 370 lb/h (168 kg/h) maximum at 800 psid (5516 kPa)
Reverse Pressure Condition	900 psig (6206 kPa)
Contaminants	The shutoff valve will operate satisfactorily when using fuel contaminated with less than 0.01% by volume of salt water compound or 4% by weight of NaCl and 96% water and solid contamination of 10 grams per 1000 gallons(US) (2.6 g/1000 L) composed of particle sizes up to 40 μ m
Fluid Supply Pressure:	
Normal	1200 psig (8274 kPa) range
Proof	1800 psig (12 411 kPa)
Burst	6000 psig (41 370 kPa)



Schematic Diagram of Liquid Shutoff Valve in the Energized Mode



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