

TecJet™ 180

Intelligent Electronic Gas Metering Valves

Description

Efficiency, performance, and emissions. In today's marketplace, these factors play a key role in gas engine development. As engine performance advances are made, gas metering devices should be more flexible and accurate, and be used for a wide range of gas qualities from butane down to landfill gas.

Meet the TecJet™ valve. The TecJet is an electronic gas metering valve for single-point injection. It has integrated sensors and electronics, which provide the correct gas flow under all specified conditions.

In general, a separate engine control system, like the EGS-02 control, calculates the desired gas flow from the different engine and gas parameters. This desired gas flow is transmitted to the TecJet valve(s) via CAN link or analog input. The TecJet valve ensures that the desired gas flow is attained, automatically compensating for changes in gas pressure and gas temperature.

The microcomputer inside the TecJet valve converts the desired gas flow signal and gas parameter information into a valve position (which corresponds to the desired gas flow), depending on gas inlet pressure, gas temperature, and the pressure difference across the valve.

Benefits

Flexible inputs to use the engine control system of an OEM. Communication in two directions possible with other control systems by means of the integrated CANbus.

Fast response to flow commands, which makes it possible to accept large load steps without losing engine speed.

High turn-down ratio that makes it possible to use one TecJet model for a complete engine family, 6 to 24 cylinders.

Application

The TecJet valve, together with an engine control system, form an ideal combination for operating gas engines with a gas specific gravity from 0.4 to 2.0. The TecJet 180 gas control valve is applicable for stationary applications within a power range of 1900–5850 kW for low-BTU specialty gas and 3800–8750 kW for pipeline-quality natural gas. These ranges are also dependent on other factors such as fuel pressure, fuel differential pressure across the valve, fuel temperature, etc. Consult the applicable TecJet Installation and Operation manual or a Woodward application engineer for actual sizing of a valve.

- Forms ideal combination with EGS-02 control
- Bi-directional communication via J1939 or custom CAN
- Microprocessor based mass gas flow control
- Fast response to flow commands
- Accurate over entire flow range
- Flow testing ensures that the engine does not have to be recalibrated if TecJet is replaced
- Compensates for gas pressure and gas temperature fluctuations
- Integrated sensors and electronics
- Requires only analog or digital desired gas flow signal and supply voltage

Specifications

Weight:	59 kg (130 lb)
Size:	180 mm
Valve Maximum Geometric Area:	16129 mm ² (25.0 in ²)
Input Voltage Range:	18–32 Vdc
Input Current Range:	≤ 5.6 steady state, 20.6 peak
Temperature Ranges	
Steady State Ambient:	–20 to +85 °C (–4 to +185 °F)
Long Term Storage:	–40 to +40 °C (–40 to +104 °F)
Short Term Storage:	–40 to +105 °C (–40 to +221 °F)
Fuel Gas Inlet:	0 to +65 °C (+32 to +149 °F)
Pressure Ranges	
Fuel Gas Inlet:	876 to 1289 mbar absolute [–138 to 276 mbar gauge at sea level] (12.7 to 18.7 psia [–2 to 4 psig at sea level])
Inlet to Outlet Delta:	70 to 276 mbar (1 to 4 psid)
Filter in the Gas Stream:	Maximum mesh size 50 µm
Flow Accuracy *:	±20% point accuracy → Crank to Idle flow rate (approximately 7% of max rated mass flow) ±10% point accuracy → Idle to 25% valve maximum rated mass flow ±6% point accuracy → >25% valve maximum rated mass flow
Dynamics	
Position Response:	Bandwidth at ±0.5% amplitude ≥ 3 Hz at –3 db (24 V supply) Bandwidth at ±2% amplitude ≥ 4 Hz at –3 db (24 V supply)
Step Response Slew Time:	< 80 ms for a 10–90% and 90–10% step (24 V supply)
Overshoot:	< 2% of the step
Flow Demand Response:	Flow demand to position demand has latency of < 4.5 ms
Pressure Change Rejection:	Same as demanded flow response with addition of 10 ms lag
Vibration:	Off-engine mounting only at this time
Shock:	Not rated
Communication/Command Signals:	CAN PWM: 7 to 32 V differential input, 12 bit resolution, 67 kΩ impedance

(*) Add an additional 1.5%, 1%, and 0.5%, respectively, to flow accuracy values listed if inlet to outlet delta is greater than 276 mbar (4 psid).

Additional Information

TecJet Service Tool: Can be downloaded from the Web at www.woodward.com/software. Select software product “TecJet Tools,” then follow the installation instructions given on that page.

Technical Manual: 35062

Adjustments

Using the TecJet Service Tool installed on a laptop or PC connected to the TecJet valve, you can monitor and make adjustments quickly and easily through the following six tabs:

Overview Tab

The Overview Tab contains flow demand, gas pressures, gas temperature, and gas property information.

Troubleshooting Tab

The Troubleshooting Tab contains typical valve information used for troubleshooting purposes. This information includes electronics temperature, supply voltage, running hours, and CAN communication info.

Warnings Tab

The Warnings Tab displays valve warning indicators. When one of these warnings occurs, the valve continues to operate, but the valve Status Output switches to signal the operator that a problem has occurred.

Errors Tab

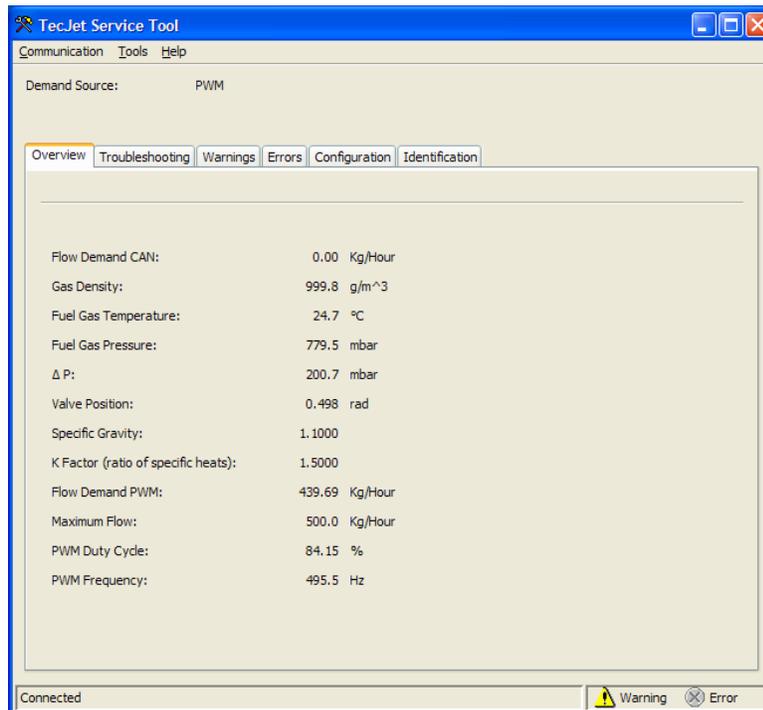
The Errors Tab displays valve error indicators. When one of these errors occurs, the valve goes into shutdown mode, and the valve status output switches to signal the operator that a problem has occurred.

Configuration Tab

The Configuration Tab allows the user to customize the valve to a particular application. CAN parameters, demand signal scaling, warning/error limits, default pressures, and demand source can all be viewed or changed on this tab.

Identification Tab

The Identification Tab contains valve and software information such as part numbers and serial numbers.



Service Tool Overview Screen



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